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Anterior Poliomyelitis:

Rehabilitation By Functional Exercises

Emil D. W. Hauser, M.D.

In the treatment of anterior poliomyelitis the reestablishment of function is the most important objective and should be borne in mind from the beginning. Treatment consists of rehabilitation from the physical, psychological, social and economic standpoints, until the patient becomes self-sufficient. Fortunately, improvement of the deformity is reflected in psychological improvement, which includes a better adjustment to social environment. All phases of the treatment are carried out simultaneously. Sometimes one part of the treatment may precede the others but sight of the ultimate goal is never lost by our becoming too absorbed in any one phase.

In the treatment of the most severe cases, that is, where there is paralysis with respiratory failure and bulbar involvement, the primary problem is to keep the patient alive. The use of a respirator, tracheotomy and good mechanical drainage, and adequate nutritional supply are the first considerations. Fortunately, in our experience most of the bulbar cases, when they do recover, make an almost complete recovery. Since this area controls so much of the entire body, edema and other secondary reactions of the poliomyelitis at this point will have an alarming effect. After the acute inflammation has subsided the recovery can be correspondingly reassuring and rapid. In this type of case it is possible to overlook the fact that the nerve power is present, since due to the original block the function along the pathways has not been reestablished. Occasionally, even though there has been a considerable time interval from the convalescent period of the acute phase until proper treatment is established, incredible recovery may be seen. Stimulation of the nerves, tendon stimulation, muscle stimulation and functional exercises are important in reestablishing the reflex pathways and the nerve control of the muscles that have been paralyzed.

A more difficult type of case is the one with complete paralysis, either of the trunk or the extremities or both, in which the nerve cell actually was destroyed so that the muscular power of the part involved cannot recover. The patient may have complete flaccid paralysis of a single extremity from the start, without any change at any time, if all the cells to that part were destroyed from the beginning. There is no treatment that will restore or increase the power of the muscles; the only possibility is to increase the function of the limb by some other means.

When the entire muscle is not paralyzed and some of the nerve cells are not destroyed, the outlook is very much better; here the nonparalyzed muscle fibers can be made to hypertrophy in size so that they can substitute for the function of the paralyzed

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fibers. This is best done by means of functional exercises.

Cooperation of the patient is essential in carrying out these exercises. His having an understanding of the condition, the purpose of the treatment, and an idea of the prognosis is an asset in obtaining the cooperation of the patient. It usually is best, right from the start, for the parents and the patient to have an honest explanation of the problem and of the probable outcome.

The education of the patient, and by this is meant the development of his intellect and the forming of good habits for living in general, is of great value in his recovery. I have seen beneficial effects in recovery in patients who received education from trained teachers while in the hospital.

It must be clearly understood that all of the usual modalities for the treatment of poliomyelitis are utilized as indicated, including:

Hot packs and warm tub baths
Muscle reeducation
Exercise in Hubbard tub
Electrical muscle stimulation
Stretching of tight or contracted muscles
Splints for protection
Surgery
Functional exercises

Certain fundamental principles apply in the reestablishment of function, although the technics may vary. Function is most important; appearance is secondary. It is interesting to note, however, that improved appearance follows improved function. On the other hand, it may be necessary to correct a deformity to improve function. Nevertheless, the rule holds that function is of primary importance.

Increase of function in a part of the body implies more than an increase of muscular power. Restoration of the function of a part does not imply rehabilitation of the individual. There was a period when the value of treatment was measured by the amount of increase in power in the muscle. At present, improvement is measured by the amount of increase in function rather than increase in muscle power as determined by a muscle test.

Pressure on the nerve cell from edema and cellular infiltration will give rise to temporary paralysis. This is similar to the temporary block of impulses which occurs from a sudden blow to a nerve. With subsidence of the swelling the return of function does not occur automatically. It is necessary to get the impulses to go through the area that was blocked. This is sometimes called "mental alienation." Physical therapy is of great value and cooperation on the part of the patient to carry out functional exercise aids in reestablishing the nerve impulses.

Theoretically, muscle fibers can be increased to ten times normal size. We may assume, in cases of partial paralysis, that the remaining muscle fibers can be tripled by means of good training. Therefore, if the nerve cells for half of the muscle fibers are destroyed, the remaining half of the muscle could be hypertrophied so that normal function would be restored. We know that professional athletes can increase their muscle power to three times that of the average person. At the same time there is no increase in the number of muscle cells or nerve cells. If we have a fifty per cent destruction of nerve cells to a limb, then the remaining fifty per cent could supply half the muscle. This half of the muscle could be hypertrophied to at least double, so that normal strength could be obtained.

A brace increases function if a part is completely paralyzed. In case of a partial paralysis that cannot be restored to full function, a brace may be used part of the time to enable the individual to meet his occupational demands. Where further recovery is expected, a brace may be utilized to protect against strain. This gives a greater capacity for work and protects the muscle against injury. There are many patients who could get along without braces but by means of them can return to work sooner. Some patients require a brace for strenuous work only. It is not necessary to wear the brace constantly; it may be left off when the physical requirements are less.

A brace should never be used to correct a deformity. The deformity is corrected first and the brace used to retain the position. A form-fitting cast sometimes is a more efficient means of reeducation for function than a brace and therefore frequently precedes the use of a brace. A deformity may be corrected by manipulation under anesthesia, followed by a cast. The patient learns to walk in the cast; after he becomes accustomed to using the limb in good position a brace should be worn to retain the position.

Deformity that interferes with function should be corrected as part of rehabilitation. For instance, if there is a tight heel cord it is best to stretch it so that function can be improved, since the tight heel cord will interfere with proper gait.

Arthrodesis of weight-bearing joints frequently gives enough stability to permit dispensing with braces. For example, arthrodesis of the talocalcaneal, talonavicular and calcaneocuboid joints in the foot will stabilize the foot but will still permit useful ankle motion. If a foot drop is present a bone block on the posterior surface of the ankle joint increases the function.

Since tendon transplants usually involve a decrease in power of the transplanted muscle, these transplants have limitations. Operations utilizing the remaining muscles in such a way as to carry out their intended function are preferable. A muscle should never be transplanted if it is not strong enough to carry out the function for which it is transplanted. Such a muscle will gradually decrease in power and the end result will be unsatisfactory. Before surgery it usually is best to obtain the maximum amount of power that can be obtained with physical therapy. This makes it possible to establish whether or not an arthrodesis is required and whether tendon transplants would be of additional value.

Capacity is increased by demanding the maximum of the individual from day to day, but strain is carefully avoided. To avoid strain, periodic rest is better than prolonged rest. Rest and exercise must be carefully graded.

The most important exercises for rehabilitation are functional. By this is meant carrying out as exercises the things that are done in the normal functions of life. This will have individual variations but some fundamental functions are obvious—standing, sitting, walking and using the hands for feeding. The program of exercise and rest then is designed to accomplish these functions.

Sitting, standing and walking involve correct posture. Poor posture is an increase of normal curves, primarily as a result of incompetence of the muscles of the abdomen and back. Furthermore, as long as these muscles remain incompetent the curves increase.

As long as the curves can be voluntarily corrected the condition is still poor posture. As soon as they can no longer be corrected voluntarily the condition is kyphosis, lordosis or scoliosis. The best treatment then is prophylaxis. This consists of periodic rest and staying within the limits of the power present, and development of structures of the trunk so that power is increased and capacity is increased; here again functional exercises are of utmost importance.

Support for the back is used to increase capacity, but a support should not be used until full capacity of remaining muscles has been obtained. Use of support over a long period of time increases fixation of the spinal column; this, in turn, increases stability and finally function.

In addition to the specific treatment for restoration of the affected parts, it still is necessary to keep in mind the importance of the restoration of the individual.

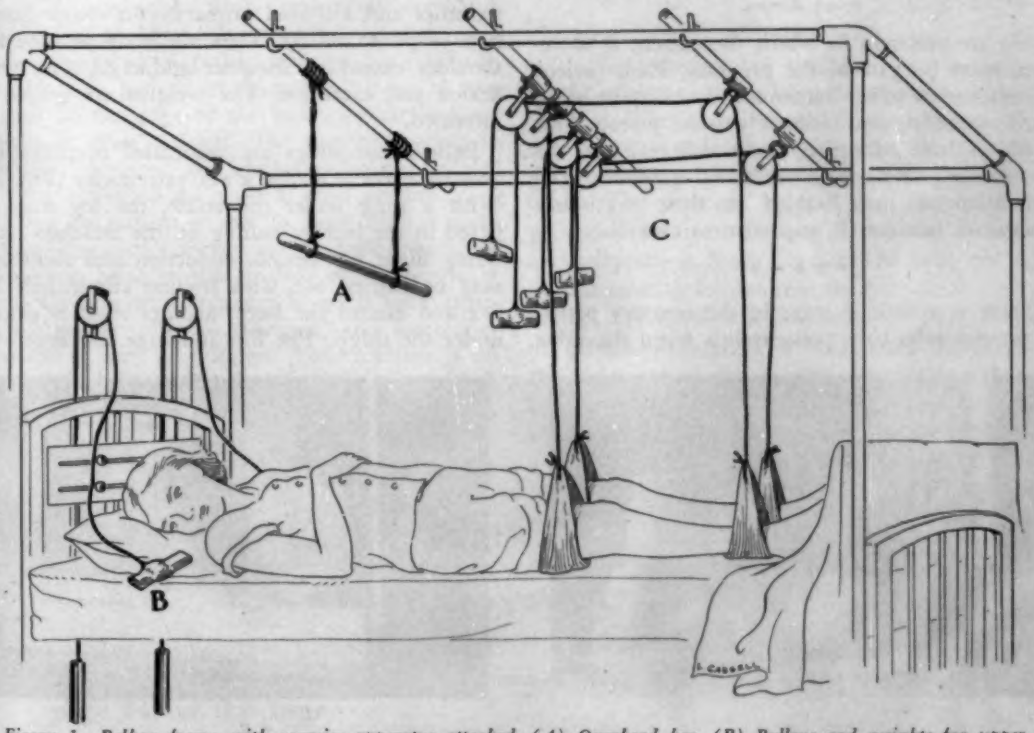

Figure 1. Balkan frame with exercise apparatus attached. (A) Overhead bar. (B) Pulleys and weights for upper extremities. (C) Pulleys and slings for lower extremities.

Cooperation of the patient is secured through an honest evaluation of the situation and by outlining a program in advance. In our experience, in the severe cases the therapeutic requirements are so great that it takes a team to carry out the best treatment. Good nursing care, good physical therapy, occupational therapy with a definite program and specific instructions for daily care from the attending physician are essential.

Consideration of the relationship between the parents and patients, as well as the consideration

Figure 2. Overhead bar being used for assistance in trunk flexion.

of the environment to which the patient is to return, must be part of the program. Each patient is evaluated as to his maximum capability in being a self-supporting and ultimately useful person. This would include education, vocational training, the use of social service and vocational guidance. The restoration of the disabled to their maximum amount of function is important to everyone.

* * * * *

There is a definite stage in the recovery period of patients who have poliomyelitis when the value of muscle reeducation decreases and the patient is not yet ready for actual occupational rehabilitation. It is for this phase that we have found the following exercises to be of value. A thorough program of muscle training is continued along with the functional exercise so long as it is considered beneficial.

Most important is the overhead bar which is attached to a Balkan frame (Fig. 1). It is useful in every case. In those cases where there is no actual paralysis of the trunk muscles the use of the bar will retain and increase the strength of these muscles. It is useful in nursing care because it assists in moving in bed. Use of the bar also helps to increase the power of the upper extremities. If the upper extremities are weak, a series of bars is hung so that the patient may grasp the low bar and work up to the higher ones. In cases of weak abdominals the bar is a great aid in starting the actual function in these muscles. It is used at first for assistance in trunk flexion (Fig. 2). As the strength increases, there is less dependence upon the bar. The chinning exercise is added as the power increases. This is done both on the hanging bar and on the crossbar of the Balkan frame.

Weights and pulleys are attached to the head of the bed in case of involvement of the upper extremities and are used primarily for elbow extension (Figs. 1 and 3). They also may be used for shoulder extension, shoulder adduction and wrist flexion and extension. The weights are gradually increased.

Pulleys and slings are suspended overhead for assistive exercise of the lower extremities (Fig. 1). With a sling under the ankle, the leg may be flexed at the hip by pulling on the attached rope. Using slight hip flexion, adduction and abduction may be carried out with friction eliminated. To flex and extend the knee, another sling is placed under the thigh. The hip and knee are flexed by

A B

Figure 3. Use of the pulley and weight for resistance in elbow extension. (A) Elbow flexed. (B) Elbow extended.

A B

Figure 4. Use of pulleys and slings for assistance in knee extension. (A) Knee flexed. (B) Knee extended.

pulling on the rope attached to that sling and the knee is extended by pulling on the rope attached to the sling under the ankle (Fig. 4).

For resistive hip extension a sling and pulley with weight attached may be used in a manner similar to that for the upper extremities. The leg is flexed at the hip by assistance of the weight and resistance is required to bring the leg to the bed.

Hand weights are used chiefly for development of elbow flexion while lying, sitting or standing, and may be used for shoulder abduction in sitting and standing positions. Any object of the desired weight which can be easily grasped in the hand is used, such as dumb-bells of graded weights.

The attempt of the patient to sit erect is a definite exercise. The patient is allowed to sit for a few seconds on the edge of the bed with the feet on a chair or other support. The time for sitting is gradually increased, but always is limited by the patient's ability to maintain a good posture.

When the patient is able to stand with a good posture this functional exercise is started. Sometimes the patient holds to the crossbar of the overhead frame for support, sometimes he starts with assistance from the physical therapist, and sometimes a walker is used for support. The emphasis is on posture and balance. The length of time the patient is permitted to stand is determined by his ability to stand correctly.

The use of a walker allows as nearly normal walking as is possible when there is extreme weakness of the lower extremities. This permits early development of normal walking. Many times the patient goes directly to correct walking without any mechanical assistance. Where crutch walking is required, correct gait with crutches is taught.

As soon as the patient is able to walk he uses this power to carry out normal functions, such as going to the bathroom, going to the physical therapy department and finally for stair-climbing and walking out-of-doors.

SUMMARY

In the treatment of poliomyelitis the use of functional exercises has been found to be extremely valuable. The exercises can be started early and can be graduated. They encourage the maximum development of the remaining individual muscle fibers. The exercises capture the interest of the patient. There is no limit to the possible variations and adaptations. Since the exercises carry out normal function, it follows that the functional capacity of the individual will be increased. This increase of functional capacity is a primary objective in the treatment of poliomyelitis. It carries with it a psychic improvement and leads to the rehabilitation of the entire individual.

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Action of the Deltoid Muscle

Marian Williams, M.A.

It often has been said that armchair investigation of muscle action, based on analysis of origin and insertion, is subject to considerable error as an accurate method of exploring muscle function. Palpation and observation of muscle activity in the living subject is a very helpful means of studying motion; however, it is limited in application as not all muscles can be reached satisfactorily. The use of the electromyograph is giving us more accurate data on *phase* of muscle activity but it does not supply definite information regarding the actual quantitative *force* contributed by component muscles involved in any given motion.

Study of patients with isolated muscular paralysis provides a very good aid in analysis of muscle function. If a single muscle loses its power completely it is reasonable to assume that alterations in function which result, as determined by comparison with the unaffected muscle groups on the opposite side, are directly related to the muscle involved. In other words, activity present on the normal side which is weakened or absent on the affected side may be considered a good indication of the contribution to movement ordinarily supplied by the paralyzed muscle. As this type of disability is not always readily available for clinical study, it should be of general interest to record data observed in such cases. The patient report presented involves axillary nerve trauma with complete loss of the left deltoid muscle.

First, however, a portion of the literature available on the action of this muscle and the part it plays in arm motion will be reviewed briefly. By virtue of its extensive U-shaped origin over the glenohumeral joint the deltoid muscle generally is considered to be a "universal elevator" of the arm, helping to raise it from the side in all directions in which it is free to move. The muscle also is described as contributing to humeral rotation, both internal and external, and to movements of the arm in the horizontal plane. Beyond this point general agreement seems to cease. Discussions regarding the relative importance of the deltoid vary greatly, as do analyses of motion of the skeletal parts involved in arm elevation. The latter will be considered first.

To begin with, the so-called "classical" description of arm abduction which formerly found wide acceptance may be reviewed in the anatomy text written by McGregor.[1] This concept holds that after arm elevation has been initiated a few degrees by the supraspinatus the deltoid moves the upper extremity to 90 degrees of abduction. During this phase the scapula must be fixed to the chest wall so firmly that it cannot move sideways or rotate in order to give the deltoid a stable point from which to work. During the second phase of arm abduction from 90 degrees to vertical, the deltoid fixes the humerus on the scapula which then is rotated upward by the serratus anterior muscle.

After reviewing the work of former investigators, Pollock[2] in 1922 described arm elevation in three cycles as follows: from zero to 60 degrees, primarily glenohumeral motion; 60 degrees to 115 degrees, principally scapular upward rotation; from 115 degrees to vertical, again largely glenohumeral motion.

Following the work of Codman, who introduced the term "scapulohumeral rhythm," Inman, Saunders, and Abbott[3] have described a definite and evenly distributed pattern of movement taking place in arm elevation in which the glenohumeral joint contributes twice as much to the total motion as the scapulothoracic. That is, for every 15 degrees of arm elevation, 10 degrees of motion take place at the shoulder joint proper and 5 are due to upward rotation of the scapula on the thorax. This 2:1 ratio holds true after the first 30 degrees of arm abduction (or 60 degrees of flexion) and continues throughout the range of arm elevation to 170 degrees. Thus, as the skeletal elements move

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simultaneously there must be a close interdependence of muscle action to carry out the normal rhythmical pattern. Upward rotation of the scapula is controlled primarily by muscle forces in line with the upper trapezius and lower serratus anterior, forming a "force couple" acting on opposite ends of the bone in opposing directions to turn it about its axis of rotation. The humerus likewise is acted upon by a pair of muscle forces in arm elevation. As the deltoid acting alone has a translatory pull lifting the humeral head straight upward toward the acromion, it must be accompanied by a second muscle force in order effectively to bring about rotation of the extremity. This secondary opposing force is supplied in a downward and slightly posterior direction by the infraspinous muscles from the scapula—the infraspinatus, teres minor, and subscapularis, which serve to depress the upper end of the humerus as the deltoid elevates it distally. By this means a rotary force couple is established, the elevator component reaching its maximum force at 90 degrees of arm abduction and the depressor component at 60 degrees at which point its magnitude actually is greater than that reached at any time by the elevating force. Here, then, the deltoid muscle cannot be considered an isolated force but rather an integral component of a complex pattern involving motion of clavicle, scapula and humerus. Moreover, its effective function depends on a second muscle group providing a depressor force near the head of the humerus which plays a role of equal importance to that of the deltoid.

In contrast to the classical description reviewed earlier, the arrangement of a rotating scapula accompanying arm elevation provides for better tension in the deltoid muscle as its origin is constantly moving upward away from the tubercle of insertion.

Meadoff and Gray[4] have published a case history involving stretch palsy of the suprascapular nerve resulting in functional loss of the supraspinatus and infraspinatus muscles. Upon clinical examination 48 hours after injury the patient was unable to abduct or flex his arm more than 30 degrees even though by myograph test both deltoid muscles appeared equally active. This limitation the authors attribute to lack of fixation of the head of the humerus within the glenoid due to the absence of infraspinatus muscle depressor action. The normal deltoid muscle apparently was unable to work effectively in the absence of a sufficiently powerful depressor force to supply the second component of the muscle force couple necessary for arm elevation.

Now consider the record regarding the importance of the deltoid muscle in arm function. Statements from five well-known texts are given first.

Dr. Colin Mackenzie,[6] who cites the "classical" description of arm elevation in two phases, has written: "In paralysis of the deltoid . . . the reason why the patient consults us is the inability to raise the hand from the side above the head."

McGregor[6] states the following: "If the deltoid is paralyzed, the person cannot abduct the arm from the side, except in an occasional very rare instance where the supraspinatus becomes capable of the task."

Bowen's[7] well-known kinesiology text, edited by R. T. McKenzie, states: "Loss of one or more of the three portions of the deltoid interferes so seriously with all movements involving elevation of the arm that subjects with this defect have much difficulty in feeding and dressing themselves. Loss of the posterior deltoid makes it impossible to put the hand behind the body at the waist line; if it is the front part the subject cannot bring his hand up to his face or put on his hat without bending the head far forward; if it is either the front or middle portion the arm cannot be lifted above the shoulder level in any direction."

Steindler[8] also stresses the disability resulting from loss of the muscle: "The deltoid is the only efficient abductor in the shoulder. . . . In addition to this, the deltoid is an important forward flexor in its anterior, and a backward flexor in its posterior portions, especially in abduction position of the arm. The most marked deficiency, however, is loss of abduction. Most often it is the midportion of the muscle which is atrophied which means that lateral abduction is abolished."

This author adds that substitutionary motion can be carried out when the triceps and biceps contract to secure the humerus against the glenoid and the trapezius-serratus system moves the shoulder blade and humerus as a whole.

In his book on shoulder lesions, Mosely[9] states of the deltoid: "In acute paralysis of this muscle the shoulder can be abducted to about 20 degrees to 30 degrees, partly by the supraspinatus and partly by the shrugging mechanism. . . . The loss of deltoid function greatly diminishes the power and range in abduction."

A marked contrast to these statements may be found in specific case histories of deltoid paralysis reported in the periodical literature. Pollock[10] describes four such patients whose shoulder motion was complete except for "abduction backward" in each instance. One was able to reach his hip pocket by sliding his hand backward and upward. Staples and Watkins[11] have reported observations on two cases of total deltoid paralysis in which

strong active abduction and normal scapulohumeral rhythm were present. The only complaints reported were fatigue and weakness in extension (backward elevation).

In studies of isolated nerve palsy, Brunnstrom[12] has described function following loss of both axillary and musculocutaneous nerves. The subject was able to flex and abduct the arm to vertical without difficulty; hyperextension was the only definitely weak motion although the patient could place his hand in the small of his back. Here the only possible substitutionary muscle was the supraspinatus as the pectoralis major was not observed to function in the motions of elevation and the biceps and coracobrachialis muscles were without nerve supply. The author concludes from comparative strength tests that the power of the deltoid and that of the supraspinatus are normally about equal in arm abduction.

Here, then, is a confusing array of testimony regarding the importance of the deltoid muscle, ranging from only slight disability resulting from its loss to marked limitation of function in which the subject can scarcely raise his arm from his side. It may be noted that texts quoted on the subject stress general loss of function, while case reports reviewed describe little loss in arm elevation but consistently record weakness in arm hyperextension.

In view of this diversity of opinion, it was of particular interest to examine and analyze the disability resulting from deltoid loss in a patient receiving treatment following trauma to the axillary nerve. The patient, aged 24 years, was injured playing football in September 1946, when his right shoulder struck the ground with considerable force. When first seen in the physical therapy clinic four months later the range of shoulder motion was excellent. His primary complaints were that he lacked speed of arm movement and that he tired easily in the area of his injured shoulder. He also reported difficulty in motions involving complete inward rotation and abduction of the shoulder as in buttoning his shirt or reaching into his rear pockets.

Strength tests were made with the Beasley myodynemeter with the arm in various positions in order to determine the extent of functional loss in terms of pound readings. Five trials were made on different days, each motion being tested three successive times. Only relative strength differences between right and left arms will be given here.

Motions with slight or moderate loss in strength: Arm abduction to vertical (with palm up or down), horizontal adduction, and internal and external rotation.

Motions with marked loss in strength: Arm flexion and particularly hyperextension.

Motions impossible to perform: Horizontal abduction (in face lying position with scapula firmly fixed), and abduction with arm in extreme inward rotation ("normal" range determined by unaffected side).

It would appear from examination of this patient that, contrary to the usual concept of deltoid function, loss of strength in arm flexion and hyperextension is more significant than interference with abduction. Also, it may be concluded that the "conventional" manual muscle test for the posterior deltoid—elevation of the arm with the patient face-lying and shoulder abducted to 90 degrees—is a valid one. On the other hand, judging from this patient, hyperextension of the arm from the side, often considered a specific test for the latissimus dorsi muscle, may be a questionable test. (It may be recalled that all specific cases described in the foregoing review of literature were reported to have weakness in arm hyperextension.)

It should be emphasized that the observations given here were made on one patient only.

SUMMARY

(1) Reports in the literature concerning arm function vary greatly regarding:
(a) Description of the joint motions involved in arm elevation, and
(b) relative importance of the deltoid muscle in arm motion.

(2) In general, texts which could be found on the subject describe marked disability following deltoid loss while specific case reports in the periodical literature record little functional loss except for arm hyperextension.

(3) Strength tests done on a patient with deltoid paralysis showed marked weakness in hyperextension, considerable loss in flexion, and only moderate loss in abduction power.

(4) Motions which could not be performed by the patient tested were:
(a) Arm abduction with extreme internal rotation, and
(b) true horizontal abduction at the glenohumeral joint.

(5) *From the one case studied,* it may be concluded that the "conventional" posterior deltoid manual muscle test is a valid one, arm forward flexion may be considered reasonably reliable for testing anterior deltoid strength, and a latissimus dorsi test involving arm hyperextension only is of questionable value.

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The Influence of Exercise on Intragastric Pressure

Sara Jane Houtz* and Helen V. Skowlund

The study of the influence of exercise on intragastric pressure is diagnostic of changes occurring in the abdomen and thorax because of the interrelationship between the cavities of the body and their enclosed viscera and blood vessels. In embryonic life the pleural cavity is in direct communication with the peritoneal cavity. Before birth mesodermal tissue spans and completely obliterates the pleuroperitoneal openings, thus forming the musculotendinous diaphragm which separates the thorax from the abdomen. Early anatomists and physiologists classified the parts or organs which were supposedly influenced by the mechanical action of respiration as follows: the circulatory system, certain nerves contiguous to the diaphragm, the abdominal viscera generally, and the lacteals and thoracic duct. Magendie[1] stated that in the abdomen the veins are subjected to alternate pressure of the diaphragm and abdominal muscles, in a manner which favored progress of venous blood in this anatomical part. Emerson[2] said that the intrathoracic and intra-abdominal pressures are to a certain degree complimentary and serve somewhat the same function, while Burton-Opitz[3], repeating the opinions of early writers, expressed the relationship of these two cavities as a force and suction pump acting on the blood vessels. Because of the far-reaching influence of pressure changes in one portion of the trunk, a brief historical review of previous investigations on the mechanics of pressure changes in both the thoracic and abdominal cavities will be presented.

Historical Review of Literature

In his famous five books "The Seats and Causes of Diseases," Morgagni[4] reported his own observations and certain unpublished experiences of his anatomy teacher, Valsalva. Included among these letters was the following passage: In severe coughing, "the natural motion of respiration is very frequently and violently changed and consequently also the motion of the blood and that sudden repercussions thereof are made upon the receptacles of the blood in the thorax is evident; so it is no less evident that in the passions of the mind, the course of the blood through these same passages is sometimes for a long while variously and vehemently excited and sometimes, as variously and vehemently retarded as the face, the respiration and the pulse do at such times certainly and jointly demonstrate." The term "passions of the mind" was referred to as anger, fear or intense emotional stress during which a deep inspiration followed by forced expiration against a closed glottis may be performed. This interesting phenomenon bears the name of Valsalva who appears to have been the first to describe it.[5]

Weber experienced loss of consciousness when he held his breath a long time.[6] In reporting a series of these experiments at a public meeting of the Royal Saxon Scientific Society in 1850, he stated that he could interrupt at will, for a moment, the beats of his heart and the pulsation of his arteries by hindering air from entering into his chest which he was at the same time compressing. Weber explains this phenomenon as a pressure in the thorax so high as to compress the veins, thus preventing the blood from entering the thorax with the result that the heart is left bloodless. He pointed out that coughing, vomiting, and defecating are all associated with thoracic compression. This phenomenon is the same as that observed by Valsalva and others.[7]

In 1901 McCurdy[8] studied the effects on arterial pressure of strain associated with lifting, using the improved sphygmomanometer developed in the early eighties. The initial knowledge concerning the variations in blood pressure during a Valsalva effort are credited to him. Other important contributors to this phase were Bruck[9] and Dawson and Hodges.[10] Changes of the heart shadow during the Valsalva effort were studied by X-ray and fluoroscope. Tschernogoroff,[11] using the electrocardiograph, studied in detail the variations of the cardiac behavior during the Valsalva effort. Johnson and Luckhardt[12] reported changes occurring in the central nervous system, while Hamilton et al[13] recorded arterial and intracranial pressure changes simul-

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Table I—Schematic Summary

	Deep Inspiration	Forced Expiration With Glottis Closed		After Effect
Heart rate	Initial quickening	Slowing	Secondary acceleration	Subsequent slowing
Arterial Pressure	McCurdy's rise 180-200 mm. hg.	Valsalva fall 60 mm. hg.	Bruck's rise 140 mm. hg.	"After-fling" Johnson and Luckhardt 200 mm. hg.
Intrathoracic pressure	Marked negative —30 to —40	Marked positive 40 to 50		Slightly negative —4 to —5
Venous pressure	——	Rise 50 cm. H_2O		Rapid fall
Heart size	Transitory stretching	Diminution		Transitory dilatation

taneously with the intracavity pressures during coughing and a Valsalva effort.

Table I summarizes the physiological changes which occur during this important but seldom considered phenomenon associated with straining effort. It is based upon the experimental data compiled by many investigators over a period of many years.

The deep inspiration preceding the Valsalva effort enlarges the size of the thorax and augments the intra-abdominal pressure, thus increasing the velocity and volume of venous return to the heart which enlarges to accommodate for the added inflow. Stretching of the cardiac muscle produces an increased energy of contraction by which a greater load of blood is ejected. This augments the arterial pressure. Bradycardia then supervenes. This may be due to the reflex stimulation of the cardio-inhibitory center as a result of the influence of elevated pressure on the efferent end-organs in the aorta and carotid sinus.

Following McCurdy's rise in arterial pressure associated with deep inspiration, the picture changes as the subject performs maximum expiration against a closed glottis. With the forced expiratory effort there is a marked rise in intrathoracic and intrapulmonic pressure. The left heart is surcharged with blood from the pulmonary area. The rise in pressures within the thorax causes a mechanical obstruction to the venous inflow. However, this is minimized to a certain degree by the concurrent rise in the abdominal pressure due to descent of the diaphragm and strong contraction of the abdominal muscles. Because the arteries are rigid, the flow of blood away from the thoracic cavity is much less affected than the flow of blood into the cavity. Thus, the heart is left almost bloodless and markedly constricted, the pulse cannot be palpated, and the systolic pressure falls, sometimes to an alarming degree. During the effort the subject suffers from hypoxia. This stimulates the vasomotor centers resulting in Bruck's rise in arterial pressure. According to Hamilton[13] the rise in blood pressure during the effort appears to be supported by the increased intrathoracic pressure. If the positive pressure of the thorax is subtracted from the arterial blood pressure, the latter rise is minimal. The pulse, however, shows marked changes, being extremely shallow with a dicrotic notch which appears later and later on the descending limb of the pulse wave as the heart rate increases. The pulse has the appearance of a beating empty heart. Throughout the forced expiration against a closed glottis, the venous pressure rises due to clamping off of the great veins by the high intrathoracic pressure. They become engorged with blood. The pooling of the blood in the venous cistern reflexly stimulates the cardio-accelerator center to greater activity resulting in a tachycardia.

With the termination of the effort, the intracavity pressures are released. Blood rushes to the heart, causing a transitory dilatation. There is a marked rise in arterial pressure, the "after-fling" of Johnson and Luckhardt,[12] and a secondary slowing of the heart rate. Thus, the intrathoracic pressure falls to approximately normal while the pressure within the arterial system rises as high or higher than the McCurdy rise.

The knee jerk is at first increased. However, with repeated Valsalva efforts the knee jerk is abolished. The increased activity was attributed by Johnson and Luckhardt[12] to anemic depression of the higher centers while the loss of reflex with repeated efforts was thought to result from anemia of the cord. Hamilton et al[13] found a marked rise in intracranial

pressure during severe coughing and a straining act. Following the effort the intracranial pressure is released and the high rise in pressure is confined to the arterial system. In general, the degree of physiological effect is proportional to the intensity and duration of the straining effort.

In 1911 Emerson[2] made an exhaustive review of the literature on intra-abdominal pressure. He found little agreement relative to estimates of the pressure within the abdominal cavity. The early investigators agree, however, that the movement of the diaphragm in the respiration varies the pressure within the abdominal cavity. The effect on venous and lymph flow of change in intra-abdominal pressure had been noted by Hall[14] in 1899.

Using simultaneously an esophageal explorer and a modified Bert's rectal explorer Luciani[5] studied the intrathoracic and intra-abdominal pressure during respiratory oscillations. According to Wagoner[15] the abdominal pressure varies with the changes in rate and depth of respiration, the bulk and position of the viscera therein, and the tonus of the abdominal wall. Spasm of the abdominal muscles or straining tends to decrease the size of the abdominal cavity and raise the pressure, stated Lam.[16] Rapid distension of the abdomen in animals markedly slows the heart rate and increases arterial pressure, while a gradual increase in abdominal pressure can be tolerated for a longer period of time.[2] This has been confirmed by others.[17]

Kountz and his associates[18] studied the influence of abdominal conditions upon intrabronchial and intrapleural pressure. Resection of the abdominal muscles and spinal nerve section of the fourth thoracic through the sixth lumbar does not vary greatly the abdominal pressure. However, the effect of activities known to influence intrathoracic and intrapulmonic pressure was lessened.

The importance of intra-abdominal pressure and the abdominal muscles as an aid to elevating the diaphragm during expiration has been discussed by Gordon, Christie, and others.[19] As symptomatic treatment of emphysema and congestive heart failure, they suggested the use of abdominal belts to increase the abdominal pressure, thus aiding the return of the diaphragm during expiration. Therefore, changes in intra-abdominal pressure may modify the heart rate, venous and lymph flow, arterial pressure and respiration.

Numerous investigators have studied the resultant effects of the increase in intra-abdominal pressure by injection of air or fluid into the cavity. Mengert and Murphy[20] appear to be the first to have measured quantitatively the intra-abdominal pressure increase due to voluntary action of the abdominal muscles during a straining effort. They were interested in determining the most advantageous position to expedite delivery during childbirth. There was a marked increase in pressure in all positions as recorded by a vaginal balloon. The magnitude of pressure, however, varied with the position assumed.

In 1939 McCurdy,[21] in a review of his early studies of intra-abdominal pressure in relation to the lifting effort, suggested that the increase in intra-abdominal pressure during strain is as great or greater than the increase in blood pressure.

The extensive recent work of Rushmer[22] was designed to explore the effects of straining procedures. Three modifications of the Valsalva effort were studied. The observations consisted of arterial pressure, venous pressure, plethysmographic studies of the little finger, intrapulmonic and intragastric pressures, and heart sizes by chest X-ray. With a rise in intrapulmonic pressure there was an increase in intragastric pressure during the modified Valsalva effort. Thus, observations of intragastric pressure during a straining effort may be taken as indirect evidence of the concomitant pressure changes which affect secondarily the heart and circulation.

Object.—In the last five years there has been a sudden impetus in the clinical use of heavy resistance exercises for the rehabilitation of the sick and disabled. These are generally associated with strain. In 1947, Hellebrandt et al[23] observed that nausea, vertigo, and headache were sometimes associated with the performance of DeLorme's[24] heavy resistance exercise and with severe work on the ergograph. These symptoms were attributed to the Valsalva effort. If this were true, those working with the sick and disabled should understand the mechanism of the Valsalva phenomenon and appreciate its hazards. The object of this study was twofold: first, to observe the influence on intragastric pressure of exercises of strain commonly employed by those administering therapeutic exercises, and second, to interpret these in terms of the accompanying Valsalva effort.

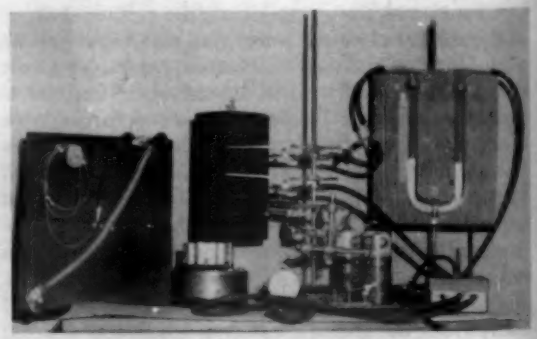

Figure 1. Instrumentation designed to measure intragastric pressure.

Mode of Procedure.—The influence of exercise on intragastric pressure was studied by the balloon manometer method (Fig. 1). A balloon of condum rubber 7 cm. long when deflated was attached to a Rehfuss tube and swallowed to a level midway between the fundus and the pyloric antrum of the stomach, as demonstrated by fluoroscopic examination. The balloon was connected to a bromoform manometer and Marey tambour. Thus, on inflating the balloon to approximately 30 mm. bromoform and closing the system, any pressure change within the cavities of the trunk could be recorded on the slowly revolving drum of a kymograph. A millimeter rule on the manometer indicated the magnitude of change in intragastric pressure. Thoracic respiration was recorded simultaneously by means of a pneumograph, an electromagnetic signal recorded time in seconds, and a marking pen indicated the duration of the events under study.

Two hundred and twenty-one experiments were performed by two healthy adult women. These included preliminary observations to standardize the instrumentation, to train the subjects, and to select suitable exercise for study.

A complicating factor in the conduct of this investigation was the distorting effect of spontaneous variations in intragastric pressure associated with normal hunger. These contractions spontaneously increase in strength and frequency, usually ending in incomplete tetanus. The cessation of the cycle is abrupt and followed by a period of quiescence. The exercises under study were commenced with the stomach in a quiescent state. It was observed, however, that moderate exercise seemed to stimulate the return of what appeared to be atypical hunger contraction. This lasted as long as the exercise was continued and never seemed to terminate in tetanus. The hunger contraction occasionally occurred simultaneously with the performance of moderate exercises. The increase in intragastric pressure thus produced in no way affects the rise in pressure due to normal hunger. When heavy resistance exercise was performed, motility was suppressed. This is in keeping with the results demonstrated by Hellebrandt and Tepper[25] in 1934, that moderate exercise did not seemingly inhibit hunger contractions. However, exhaustive protracted work delayed the motility of the stomach for some time following exercise.

Exercises.—The exercises selected for preliminary survey were taken from the Army[26] and the Navy[27] Reconditioning Manuals, DeLorme's heavy resistance program, ergographic studies, and miscellaneous activities.

To estimate the severity of the selected activity in terms of pressure changes thought to affect the circulation, the subject routinely performed a standard

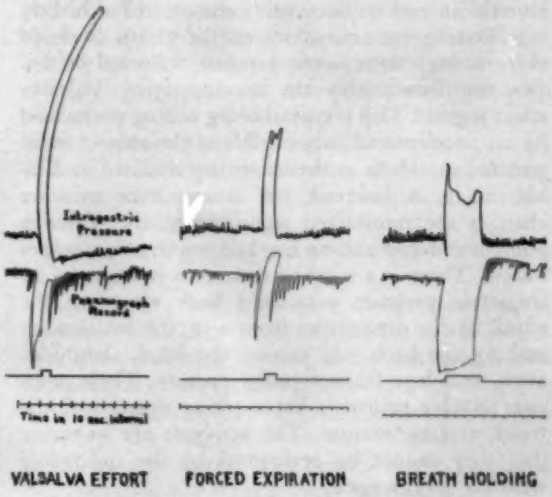

Figure 2. Criteria used for comparison of intragastric pressure change during exercise.

breath holding test or an extreme Valsalva effort. Figure 2 illustrates the change of intragastric pressure during a Valsalva effort, forced expiration and breath holding following a deep inspiration. The intragastric pressure observed during a Valsalva effort is significantly greater than either the changes during forced expiration or breath holding. All three demonstrate transitory hyperpnea following the effort.

Results and Their Interpretations.— The placement of the arms during "sit-ups" from a supine position modifies the magnitude of intragastric pressure change. This is greater in exercises when the arms are extended overhead than when the hands are placed behind the neck or at the sides. In comparing a single leg lift with a double leg lift, in the supine position, intragastric pressure differs markedly. The magnitude of pressure change relative to the double leg lift is strikingly greater than the single leg lift. This suggests that less severe exercises should intervene in a graded program of activity. Some lower extremity exercises, performed in a supine position, illustrate a sustained increase in intragastric pressure which continues throughout the effort. These include "bicycling", flexion and extension of the knees, and flutter kick with the knees extended, the thighs in a position midway between extension and 90 degrees. Prolonging the performance of each of these activities may increase the severity of the accompanying Valsalva effect.

In surveying the pressure changes accompanying the common therapeutic exercises it became apparent that the concomitant respiratory pattern markedly modified the severity of the straining effort. Figure 3 illustrates alternate leg raising from a supine po-

sition with and without volitional control of breathing. During exercise in which the glottis is closed there is high intragastric pressure followed by hyperpnea. Presumably the accompanying Valsalva effect is great. This is typical of leg raising performed by an uninstructed subject. When the subject is instructed to exhale as the extremity is raised and inhale as it is lowered, the concomitant pressure changes are minimized significantly, the Valsalva effort is reduced and no marked respiratory changes follow. There is a marked transitory increase in intragastric pressure associated with elevating the trunk by the extremities from a supine position, or arching the back and raising the head, shoulders, arms, and legs from a prone posture. These exercises involve primarily the extensor muscles of the trunk and extremities. The activities are so severe that they cannot be performed by the individual with the glottis open.

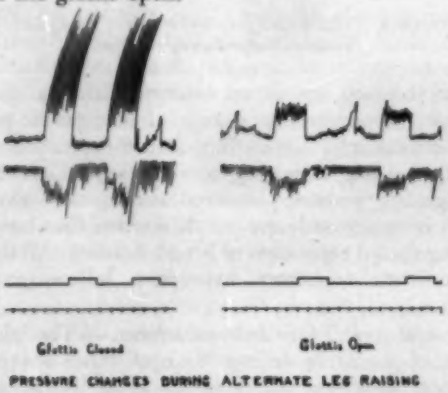

Figure 3. Exercise performed in bouts of 10, with and without breath holding.

The record made during the quadriceps extension series, illustrated in Figure 4, demonstrates the pattern characteristic of the change in intragastric pressure during heavy resistance exercise of the DeLorme type. These pressure changes were equally as great during the biceps curl executed in a standing position. The seated subject extended the knee carrying a light weight of twenty-five pounds on the foot. This causes a slight rise in intragastric pressure. As the load increases, the pressure increases proportionately and the Valsalva effect becomes greater. Marked respiratory changes follow the bouts in which the subject lifts very heavy loads.

Discussion

The physiological changes occurring within the cavities of the body during a Valsalva effort and exercises of strain suggest that their effect on the circulatory and respiratory systems are of importance in the administration of therapeutic activities to those convalescing from disease. The individual,

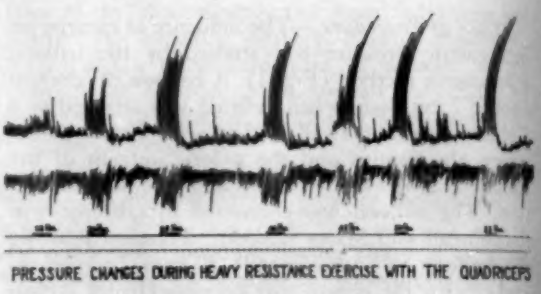

Figure 4. Maximum pressure changes were reached in the fifth bout.

bedridden due to injury or disease, reacts physiologically during exercise in a manner similar to the untrained person. The fatigue and soreness accompanying skeletal muscle exercise is of minor importance compared to the poor capacity of the untrained physical machine to meet the demands placed on the circulatory and respiratory systems. It was noted in our series that the intragastric pressure was high during the initial execution of exercises performed by the normal subject. As skill increased, however, the magnitude of changes as reflected by intragastric pressure decreased.

The timing of inspiration and expiration during exercises of effort is another factor which markedly modifies the magnitude of pressure change in the thorax and abdomen. To perform relatively simple activities the sick or disabled must exert a greater effort than the normal individual. This often is accomplished by fixation of the chest and abdominal wall. To avoid creating unnecessarily high pressure within the thoracic and abdominal cavities, the patient must be taught how to perform the exercises with the glottis open. Thus, skill and the method of performing exercises in a graded program are of primary importance in the application of exercises of strain to the sick and disabled.

Straining effort probably should be avoided in certain pathological conditions. The heart with inadequate coronary circulation and insufficiency may have difficulty adjusting to the diminution in venous return and the anoxemia which follows as the effort is prolonged. With repeated Valsalva efforts such as accompany heavy resistance exercise, the heart may not have sufficient time to recover from one interval of strain before a second embarrassment is placed upon it. The force and volume of venous return following the cessation of the straining effort may be so high that patients with limited cardiac reserve may be unable to withstand the surcharge without abnormal dilatation. Mos'er at al[28] found in patients with hypertension and cardiac insufficiency that the pulse pressure did not demonstrate the typical rise on deep inspiration. However, during the Valsalva

effort the pulse rose continuously, that is, not plateauing as in the healthy individual, and rose to a higher than normal level. He stressed the fact that people with heart involvements should avoid straining acts. Because of the marked changes in blood pressure following the effort, the arteries must be able to sustain high pressures without rupture. These pressures, being transmitted directly to the craniospinal canal and arterial tree, may be a causative factor in cerebral accidents.

Heavy resistance exercises for the upper extremities have been advocated late in the graded program following chest surgery for empyema, bronchiectasis, hemothorax, diaphragmatic hernia, spontaneous pneumothorax, and cysts of the lungs. Breathing, postural, and strength exercises are considered to be an important aid in developing a more normal respiratory behavior after the causative factor of the respiratory disability has been removed surgically. Joannides[29] demonstrated in dogs that when intrapulmonic pressure was augmented to 60-100 mm. Hg., a syndrome of interstitial emphysema, pneumothorax, pneumoperitoneum, and air embolism developed. Haldane and Priestly[30] thought these syndromes could be averted by binding the chest or by strong muscles capable of immobilizing the thoracic wall. In a weakened or diseased thorax the hazards of high intrapulmonic pressure may be great.

Hernia has been defined as a congenital or predisposing weakness in an abdominal structure which during severe strain or extraordinary physical effort may force or cause expulsion of various organs or tissues through the defect. If intra-abdominal pressure is markedly increased by the combined efforts of the diaphragm and abdominal muscles, the hernial orifice may be released in valve-like action and yield a place of exit through which the force will be spent. Incompletely healed postoperative scars often are vulnerable to herniation. Where there is danger of hernia, high intra-abdominal pressure may be avoided by limiting exercises to those which can be performed with the glottis open.

If the abdominal muscles are paralyzed unilaterally, the force created within the cavity may herniate the weakened portion of the wall. However, the force of the expiratory effort would be lowered because the abdominal muscles are important in the performance of this activity.

DeLorme's heavy resistance exercises originally were used in the physical treatment of healthy young adult males with orthopedic injuries sustained in military service. Recently, however, they have been applied to individuals in all age groups without sufficient regard for the hazards involved.

SUMMARY AND CONCLUSIONS

Two hundred and twenty-one experiments were performed by two healthy adult women. These included a study of the spontaneous motility of the fasting stomach and a survey of the influence on intragastric pressure of exercises performed with and without the glottis closed. The evidence presented supports the following conclusions:

1. The intragastric pressure developed during exercises of strain is directly proportional to the severity of the effort.

2. For each exercise there is a repeatable pattern of intragastric pressure change.

3. Exercises which produce the greatest rise in pressure within the cavities of the trunk are invariably associated with fixation of the chest and forced expiration against a closed glottis.

4. The increase in intragastric pressure and, presumably, the magnitude of the Valsalva effort is much greater during DeLorme's heavy resistance exercises than any other activity studied.

5. Certain exercises of strain, including DeLorme's exercises carrying very heavy loads, cannot be performed without Valsalva effort.

6. If the subject is encouraged to breathe during less severe forms of exercise, the rise in pressure within the cavities of the trunk is significantly reduced.

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(Continued from page 157)

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MAKING PHYSICS A PART OF THE CURRICULUM: *Three methods of incorporating physics in the nursing school curriculum.* HESSEL H. FLITTER, R.N.

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The Late Effects of *Minor Degrees of Poor Posture*

John G. Kuhns, M.D.

Much has been written concerning the immediate and readily discernible effects of faulty posture of severe degree. But the changes which take place with mild deviations from good posture, often unnoticed, are rarely mentioned and seldom considered in the treatment of many slowly developing disabilities. The insidious onset of these disabilities makes us forget that disalignment of the body may have a major part in their causation. But the prompt relief in symptoms which often follows a minimal improvement in bodily alignment makes us wonder whether mild faulty posture does not play a very important role in the genesis of many disabilities.

These minor faults in the normal alignment of the body eventually lead to pain and disability in three noteworthy ways: (1) They produce a slight incongruence in articular surfaces. The opposing hyaline cartilages are no longer completely parallel; the pressure of weight, the jars from sudden movement, the stresses from muscular pulls, all are distributed unevenly upon the articular surfaces. (2) Minor disalignments, particularly in weight-bearing joints, lead to overstretching and weakening of the supporting ligaments about the joints. This makes the joints much more susceptible to sprains. (3) The muscles about the articulations slowly become fatigued and weakened. They no longer have only a balancing function when the body is erect but they frequently must act vigorously to combat gravity. Eventually they become stretched and lose strength. Permanent weakness and relaxation may result.

These long-continued effects of minor degrees of faulty posture produce a number of changes, often after many years. Degeneration and decreased elasticity are found in the articular cartilage. Spur formation about the margins of the joint is one of Nature's attempts to make the articulation more stable. Weakening from overstretching and contractures from persistent relaxation are found in the muscles and ligaments.

The recognition and measurement of these minor degrees of faulty posture is not always easy. We frequently are looking for a more serious and rapidly acting cause, and a more easily discernible malalignment of the body. Quantitative variations from what is accepted as normal carriage and function of that part of the body may escape cursory examination. There are many variations in normal alignment depending upon difference in body build and in changes in ligamentous relaxation. But the mechanical principles are the same with all types of body build and ligamentous relaxation. The parts of the body are balanced efficiently without strain of muscles and ligaments and without articular disalignment. When faulty posture is present disalignment is present and disabilities are slowly developing. Satisfactory criteria for measuring the adequacy of bodily alignment are the following: The body at all times should be as tall as possible; there should be no increase in the anterior-posterior curves. There should be no habitual depression of the sternum and anterior thoracic wall with its rounded shoulders and increased dorsal kyphosis. The greatest girth of the body should be at the level of the lower sternum. The lower abdomen should be flat with firm, well retracted abdominal muscles.

These minor postural disalignments often require years for the development of symptoms. Minor disabilities are very common but symptoms of a serious degree are not often encountered. Nature has provided a tremendous reserve which is broken only after a long time. Then symptoms frequently are found with degenerative lesions in elderly people.

The early appearance of symptoms usually is

372 Marlborough Street, Boston 15, Massachusetts.

Read before the New England Society of Physical Medicine, October 20, 1948.

hastened by the presence of some other deformity either congenital or acquired or by some muscular weakness. This added to faulty posture can quickly break down the reserves of the body and bring pain and disability with varying initial symptoms. While there are associated disalignments of the whole body, the symptoms usually are referred to the part of the body which is especially disaligned. A disease process makes the onset of pain and disability easier to develop. The common areas in which these symptoms are found are the neck, the lower dorsal spine, including the rib joints, the lumbosacral region, the hip joint, the knee and the foot.

An increased forward position of the head, a lordosis of the cervical spine, is a very common postural deformity. Usually it is accompanied by other postural displacements in the lower portions of the spine but usually the patient complains only of the neck. There is no certain degree of lordosis at which symptoms will arise. Definite evidence of its importance in causing the symptoms usually can be seen in x-ray pictures. If these show the surfaces of the cervical vertebrae not parallel but at an angle with each other, if the intervertebral articular processes project into the neural foramina; and if the spinous processes impinge upon each other, the mechanical alignment is sufficiently severe to produce symptoms (Fig. 1).

The early symptoms are muscular spasm and pain in the posterior cervical muscles. There may be stiffness on motion, tenderness along the transverse processes of the cervical vertebrae and radiating pain over the occiput or about the shoulder girdle. The irritation of the cervical nerves usually is most severe at the apex of the cervical curve. With a high cervical curve, pain over the occiput is the common finding. With a lower cervical lordosis, pain over the shoulder usually is found. Limitation of motion in the neck is common, with tenderness over the semispinales muscles. X-rays usually show, in addition to the increased lordosis, a certain amount of osteoarthritis about the cervical vertebrae.

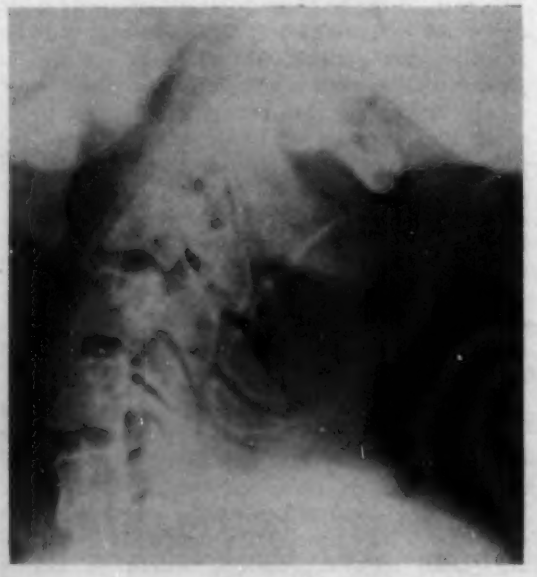

Figure 1. Cervical spine showing marked lordosis. The interspinal joints are in disalignment and the neural foramina are narrowed.

Treatment often must combine general upbuilding measures, support to the neck, heat and exercises. The chief factor is postural correction. Often this alone brings a subsidence of symptoms. Without this no continued relief of symptoms will be realized. At first treatment is given in recumbency. Exercises in extension of the cervical spine are given and later postural exercises to improve the alignment of the whole body are given in sitting and standing. Support to the cervical spine may be required. Traction on the cervical spine, heat and x-ray therapy to the cervical spine are sometimes helpful supplementary measures.

Associated with postural deformities in the cervical spine one often finds a depression of the shoulder girdle. The position of the shoulder girdle and the size of the superior opening of the thoracic cavity are the result of the contraction or relaxation of the muscles connecting the upper cervical spine and skull with the ribs, clavicle and scapula. These muscles become relaxed with a forward position of the head and increased lordosis of the cervical spine. The superior thoracic opening becomes narrowed. The first rib or a cervical rib may become depressed with a greater downward inclination of its anterior portion. This is probably the chief reason why symptoms of a cervical rib or a mobile first rib which has been present from birth begins to produce symptoms in adult life only after faulty posture leads to gradually greater downward displacement of the rib. The scalenus anticus syndrome is another gradually developing disability with involvement of the first rib and its scalenal insertions which has been reported in medical literature. This often is relieved by relaxation of the muscle or by improvement in posture. Decreased efficiency of the shoulder girdle musculature follows such downward and forward displacement of the shoulder. There usually is increased development of osteoarthritis at the acromioclavicular joint. Often there is impingement of the lesser tuberosity of the humerus with the coracoid, frequently with inflammation of the subscapularis bursa. Muscular and ligamentous sprains occur more easily.

Let us now consider the lower dorsal spine, another area where long-continued faulty alignment leads to symptoms particularly after middle life. If there is no associated congenital deformity or disease, symptoms and disability appear early. But if there is a congenital deformity leading to increased kyphosis, or if disease, especially epiphyseal disturbance of the spine, is present, symptoms of pain and muscular strain may appear during adolescence. However, no disease is required for the gradual onset of disability. Increased bony proliferation occurs about the margins of the vertebral body. This makes for greater stability of the spine but also for decreased motion in this region. Stiffness and pain after slight exertion are common and these subside slowly (Fig. 2).

Figure 2. Faulty posture with head forward, shoulders rounded. The lower dorsal spine shows increased kyphosis, producing symptoms along the intercostal nerves.

Associated with increased roundness or kyphosis of the lower dorsal spine is the effect produced on the rib joints, the costo-vertebral and the costo-transverse. Besides the alteration in their axis at the spine, produced by the kyphosis, is the increased downward displacement of their anterior portions which always accompanies increased lordosis. This gradually leads to sprain from twisting of the head of the rib on its supporting ligaments. Tenderness over the head of the rib is commonly found with some pain on deep inspiration without any evidence of interthoracic inflammation. Probably of most annoyance to the patients is the associated irritation of the intercostal nerve, called by Carnett "intercostal neuralgia." This pain usually is referred to the lateral or anterior distribution of the involved nerve.

The relation of minor degrees of faulty posture to pain in the low back has been mentioned so often that we hesitate to mention it. But it so frequently is forgotten and the lesser degrees of disalignment are often considered of little or no importance in disabilities in the low back. The human body functions as a whole, and disalignment in the cervical or thoracic spine must be accompanied by equal displacement in the lumbar spine in order to balance the body. If the spine is strong and stable, i.e., without abnormalities or disease in the lumbosacral region, trouble will not appear, except in the case of severe injury, until middle life. With the increased forward inclination of the pelvis, torsion occurs at the sacroiliac joint with strain upon the sacrospinous and sacrotuberous ligaments. Of greater concern is sprain about the lumbosacral joint and its supporting ligaments and muscles. This is sometimes accompanied by irritation in the sciatic nerve.

Of equal concern is the effect of faulty posture upon the hip joint. With the forward inclination of the pelvis, relaxation of the anterior structures about the hip occurs with stretching of the posterior structures particularly the gluteus medius and maximus. The iliofemoral ligament, the Y ligament of Bigelow, becomes relaxed, lessening the stability of the hip. The posterior muscles become weakened. Thus sprains of the hip joint are more likely to occur. The head of the femur comes to press against the weaker posterior portion of the acetabulum and capsule instead of the stronger superior portion of the acetabulum. This leads to the more early development of osteoarthritis, so-called "malum coxae senilis." Bursitis also develops more readily from the changed pull of the muscles with increased friction and strain.

At the knee postural deformities often are overlooked since the changes here are more frequently secondary than primary. This has been best described by Graham who has shown that with forward inclination of the pelvis there is a tendency for the femoral columns to rotate inward to support the forward displacement of weight over the center of gravity. Rotation can take place inward to produce this forward shift at the hip joint and at the posterior tarsal joints but no inward rotation can take place at the knee joint. This leads to the development of a knock-knee deformity, genu valgum, in growing children. The disalignment of the articular surfaces leads to sprain and to the development of osteoarthritis. This deformity develops usually very slowly.

Disability in the foot may come as a postural deformity. This usually begins as a pronation of the foot associated with internal rotation of the femur. The thrust of weight is also distributed incorrectly through the ankle joint. Valgus and depression of the longitudinal and transverse arches of the feet gradually increase in extent. Symptoms appear when the articular alignment of the tarsal joints and the stretching of ligaments produce sufficient irritation of the sensory nerve endings in this region. Often years are required before pain and limp cause the patient to seek treatment. Treat-

ment to be effective should combine local support and proper shoes with proper alignment of the foot through muscular reeducation and improvement of the posture of the whole body.

One could go on indefinitely but these examples suffice to show that minor degrees of faulty posture can in time produce serious disability in various parts of the body. It remains for us to mention what procedures are carried out to relieve symptoms and disability. When the patient consults his physician the condition is rarely purely postural. There are often many other features, often degenerative in character although the genesis of the disability may have been purely postural originally. In elderly individuals our treatment is palliative rather than curative. Many things may be required in treatment but it is surprising what improvement in disability and what relief of pain follow postural correction alone. Usually complete correction cannot be obtained because the changes in the structures have been too extensive. Full correction is rarely necessary to relieve symptoms. The body compensates a long time for disalignment but eventually functional compensation is broken. Then symptoms and disability appear.

Treatment at first consists of temporary rest until muscular spasm abates. Heat for twenty to thirty minute periods several times a day helps to relieve pain. Then support is given until symptoms disappear. The support which is provided depends upon the degree of deformity. It may vary from an elastic cotton bandage to rigid plaster. It is discontinued with subsidence of muscular spasm and pain. In severe disability in elderly individuals some support may be necessary to prevent symptoms through the remainder of the patient's life. In addition to support, exercises are given to improve gradually the alignment of the patient's body and to strengthen the weakened muscles. Gentle passive stretching sometimes is of value. Of greatest help is improvement in the alignment of the whole body.

Reminiscenses of Dr. Joseph Bell: The Prototype of Sherlock Holmes

By J. Gordon Wilson, M.D.

There are few, if any, greater names in detective fiction than that of Sherlock Holmes (Conan Doyle), and there are few more interesting partnerships in crime detection than Holmes and Watson. There is ample evidence that the prototype of Sherlock Holmes was Dr. Joseph Bell, the famous Edinburgh surgeon; Doctor Watson, a mythical retired Indian surgeon to whom Doyle related the exploits of Sherlock Holmes, was probably suggested by Boswell, the famous biographer of Dr. Samuel Johnson. Sherlock Holmes was created by Doyle in the story "A Study in Scarlet" written in 1887.

It is a tribute to the ability of Conan Doyle as a writer of fiction that his characters are so presented as to be regarded as actual personalities.

Conan Doyle had graduated at Edinburgh (1881) before I began the study of clinical surgery, and even then he was becoming known from his short stories. As a student in the Edinburgh Infirmary, Doyle was on service in the wards of Dr. Joseph Bell, a famous clinical teacher of surgery who taught that there were many advantages for the student in rapid but accurate recognition of the symptoms of disease, and how by observation of the patient the student could get much information regarding his history.

Based on the observation of the methods of Bell, Doyle later tried to build up a scientific detection of crime, independent of errors made by the criminal. "Bell," said Doyle, "took a keen interest in my detective tales and even made suggestions which were not, I must say, very practical." However, Bell says, in a letter to an intimate friend, that he was not flattered by what he called his nickname Sherlock Holmes. A good picture of the real Doctor Bell is given in the sympathetic biography of his life by Doctor Saxby. "I hope," Bell wrote, "folks that know me see another and better side than what Doyle saw. You will not let me be maligned. Why bother about the cataract of drivel for which Conan Doyle is responsible? I'm sure he never imagined that such a heap of rubbish would fall on my devoted head in consequence of his stories. The only credit I can take to myself in what Holmes says is that appertaining to the circumstances that I always impressed over and over again upon all my scholars—Conan Doyle among them—the vast importance of little distinctions, the endless significance of trifles."

—From Quarterly Bulletin, Northwestern University Medical School, Summer Quarter, 1948.

SCHOOLS APPROVED FOR TRAINING PHYSICAL THERAPISTS

By Council on Medical Education and Hospitals of the American Medical Association

Name and Location of School	Medical Director	Technical Director	Entrance Requ'rements*	Length in Months	Classes Start	Tuition	Certificate, Degree, Diploma
CALIFORNIA							
Children's Hospital, Los Angeles	Samuel S. Mathews	Sarah S. Rogers	a-b-d	14	Sept	$300	Cert. or Degree
College of Medical Evangelists, Los Angeles[1]	F. B. Moor	R. Wm. Berdan	a-b-c-d	12	Sept	$225	Cert. or Degree
University of Southern California, Los Angeles	Charles L. Lowman	Charlotte W. Anderson	a-b-d[2]	12	Sept	$496	Cert. or Degree
University of California Medical School, San Francisco[1]	Lucile M. Eising	Margery Wagner	d-e	12	Sept	$220[4]	Cert. or Degree
Stanford University, Stanford[1] (Palo Alto)	Wm. Northway	Lucille Daniels	a-b-d[2]	12	Jan June	$523.30	Cert. or Degree
COLORADO							
University of Colorado Medical Center, Denver	Harold Dinken	Mary Lawrence	a-b-d	12	Sept	$300	Cert. or Degree
ILLINOIS							
Northwestern University Medical School, Chicago	John S. Coulter	Gertrude Beard	a-b-d	12	Oct	$450	Cert.
IOWA							
University of Iowa Medical School, Iowa City	W. D. Paul	Olive C. Farr	e	12	Sept	$200	Cert.
KANSAS							
University of Kansas School of Medicine, Kansas City	Donald L. Rose	Lilyan G. Warner & Ruth Monteith	a-b-c[3]	12	Feb Sept	$80[4]	Cert. or Degree
MASSACHUSETTS							
Bouve-Boston School of Physical Education, Boston	Howard Moore	Constance K. Greene	H.S.	36	Sept	$500 yr.	Degree
Simmons College, Boston	Wm. T. Green / Arthur L. Watkins	Janet B. Merrill	a-b-d	16-36	Sept	$550	Cert. or Degree
Boston University College of Physical Education for Women: Sargent College, Cambridge 38	Kenneth Christophe	Adelaide McGarrett	H.S.	36	Sept	$435 yr.	Cert. or Degree
MINNESOTA							
University of Minnesota, Minneapolis[1]	Miland E. Knapp	Ruby M. Green	H.S.	36	Oct	$530[4]	Degree
Mayo Clinic, Rochester	Earl C. Elkins	Helen Belknap	a-b-c	12	Jan July	None	Cert.
MISSOURI							
Washington University School of Medicine, Barnes Hospital, St. Louis[1]	Sedgwick Mead	Beatrice F. Schulz	c	2 yrs	Sept	$400 yr.[5]	Degree
St. Louis University School of Nursing, St. Louis[1]	Alexander J. Kotkis	Sr. Mary Imelda	H.S.	36	Jan Sept	$300	Degree
NEW YORK							
Albany Hospital, Albany	John W. Ghormley	Catherine Graham	a-b-d	12	Sept	$250	Cert.
Columbia University, New York City[1]	Wm. B. Snow	Josephine L. Rathbone	a-b-c	1 or 2 yrs	Sept	$450 yr.	Cert. or Degree
New York University School of Education, New York City[1]	George G. Deaver	Elizabeth C. Addoms	a-b-d	12	Sept	$589	Cert or Degree
NORTH CAROLINA							
Duke University School of Medicine, Durham[1]	Lenox Baker	Helen Kaiser	a-b-d	15	Oct	$300	Cert.
PENNSYLVANIA							
D. T. Watson School of Physical Therapy, Leetsdale[1]	Jessie Wright	Kathryn Kelley	a-b-d	12	Oct	$300	Diploma
Graduate Hospital, University of Pennsylvania, Philadelphia[1]	George M. Piersol	Dorothy Baethke	a-b-e	12	Sept	$300	Cert.
TEXAS							
Hermann Hospital School of Physical Therapy, Houston	Oscar O. Selke, Jr.	Mary Elizabeth Kolb	a-b-d	12	Oct	$300	Cert. or Degree
University of Texas School of Medicine, Galveston	G. W. N. Eggers	Ruby Decker	a-b-d	12	Jan	$163[4]	Cert.
VIRGINIA							
Baruch Center of Physical Medicine of the Medical College of Virginia, Richmond[1]	Walter J. Lee	Susanne Hirt	a-b-c[3]	12	Sept	$351[4]	Cert. or Degree
WISCONSIN							
University of Wisconsin Medical School, Madison[1]	Harry D. Bouman	Margaret Kohli	a-b-c[3]	12	Sept	$120[4]	Cert. or Degree

*Courses are so arranged that any of the entrance requirements will qualify students for training. a = Graduation from accredited school of nursing; b = Graduation from accredited school of physical education; c = Two years of college with science courses; d = Three years of college with science courses; e = Baccalaureate degree; H.S. = High School graduation.

[1]Male students are admitted.

[2]High school graduates accepted for a four-year course leading to A.B. degree.

[3]High school graduates accepted for four-year college course.

[4]Nonresidents charged additional fee.

[5]Certificate granted by Children's Hospital Society; degree granted by University of California at Los Angeles.

[6]Tuition reduced second semester of second year.

Editorials

For our readers' convenience and information a program of the forthcoming conference of the American Physical Therapy Association is printed in this issue of the REVIEW. It is as nearly complete as possible at this time. Careful reading of the program reveals that it is well-planned and that sufficient time is allowed for each speaker to adequately cover his subject. A conference-type program was followed using the general theme "Neurological Disorders." Treatment of the hemiplegia, cerebral palsy, poliomyelitis and multiple sclerosis are some of the subjects which will be discussed. In addition to the development of this central topic, various unrelated subjects will be presented, including arthritis, research papers prepared by members of the Association and clinical demonstrations. The total program offers a valuable opportunity to hear authoritative speakers on a variety of interesting subjects. We can anticipate with assurance a stimulating meeting.

Now is the time when we must make definite plans for attendance at the conference. There is a good balance between scientific, business and social sessions. If you have attended previous annual meetings you will need no urging; if you have never had the experience, you should make the Boston meeting your first one. Our Association conferences are unique in that they combine a sort of fraternal atmosphere with serious, professional activities. Many physical therapists make a trip to conference the basis for a vacation and feel that it is the best part of their holiday. For a first-hand education in National Association activities, for a refreshing scientific program and for a good time, come to Boston, June 19-24.

Integration of Hospital Departments

Perhaps never before in the history of hospitals has there been such a positive interest on the part of all professions in improving the care of the patient. From this widespread interest has developed an understanding of the significance of integration among departments as an important factor in good patient care. The attempt to achieve integration, in turn, has focused attention on the basic necessity for mutual understanding of the capacities and limitations of personnel in the several departments, and on the "new" technic of group dynamics that is proving increasingly useful in establishing this vital understanding. Yet, while the use of group dynamics as a technic is spreading through several departments and branches of hospital operation, it has thus far generally, and perhaps unwisely, not included physical therapy personnel.

Group dynamics is a special technic through which groups of hospital personnel with related interests are brought together to talk and think things out in concert. This process of working together strikes at the core of one of the major unresolved problems in hospital administration, the lack of understanding and appreciation of one group of specialized personnel for the work of other groups.

Although there is no comprehensive record of hospitals now using this method, a number are experimenting successfully with it. Some have reported their progress and results to the American Hospital Association. The fields in which reporting hospitals have experimented are quite diverse. For example, the technic has been employed in problems relating to nursing, out-patient departments, human relations and personnel, as well as in a number of other areas.

Genuine enthusiasm is apparent among those who have used the technic. Admittedly, the method is time-consuming, but the results seem to be so unprecedented in the hospital field as to fully justify its use. In the light of experience this far, it would seem advisable to include also physical therapy personnel to whom it may well prove as useful as it has to others.

—HUGO V. HULLERMAN, M.D.

Congratulations

The American Physical Therapy Association is very proud that Catherine Worthingham, a director of the Association and former president (1940-44), has been the recipient of an honorary degree, Doctor of Science, from Boston University. She is the first member to be so honored.

The recognition of Miss Worthingham's long record of service to the profession is most gratifying to us, the members of the American Physical Therapy Association. She has given unceasingly of her time, energy and knowledge to develop physical therapy and the Association. We have grown in stature professionally through her efforts. Our heartiest congratulations are extended to Catherine Worthingham, Doctor of Science.

Annual Conference of the American Physical Therapy Association

Copley Plaza Hotel, Boston, Massachusetts

JUNE 19-24, 1949

Sunday, June 19

11:00 a. m. "Brunch" School Section
3:00 p. m. Registration
7:30 p. m. Formal opening of 26th Annual Conference — Lois Ransom, President, American Physical Therapy Association
Greetings from Massachusetts Chapter
"New Horizons and New Responsibilities" — Howard A. Rusk, M.D., Director, Institute of Rehab. and Phys. Med., New York Univ. — Bellevue Med. Center, New York, N. Y.

Monday, June 20

9:00-12:00 noon General Session — House of Delegates
12:00- 2:00 p. m. Luncheon
2:00- 5:00 p. m. The Neurological Basis for Treatment of the Hemiplegia
"Methods of Reducing Spastity in Certain Types of Hemiplegia" — Temple Fay, M.D., Director, Neuro-Phys. Rehab. Clinic, Phila., Pa.
"The Rehabilitation of the Hemiplegia Patient"—Donald A. Covalt, M.D., Clinical Director, Institute of Rehab. and Phys. Med., New York Univ. — Bellevue Med. Center, New York, N. Y.
7:30- 9:00 p. m. Movies

Tuesday, June 21

9:00-12:00 noon The Neurological Basis for Treatment of Cerebral Palsy
"Neurological Aspects of Cerebral Palsy" — Temple Fay, M.D., Director, Neuro-Phys. Rehab. Clinic, Phila., Pa.
Subject and speaker to be announced
12:00- 2:00 p. m. Luncheon
2:00- 5:00 p. m. General Session — House of Delegates
7:30 p. m. Banquet (Informal)

Wednesday, June 22

9:00-12:00 noon Poliomyelitis
"Poliomyelitis" — Thomas Gucker III, M.D., Mass. Infantile Paralysis Clinics of Children's Hosp., Boston, Mass.
"Early Care of the Poliomyelitis Patient" Demonstration — Shirley Cogland, Asst. Technical Director, Dept. of Phys. Therapy, Children's Hosp., Boston, Mass.
Theresa Fallon, Consultant, Joint Orthopedic Nursing Advisory Service, New York, N. Y.
12:00- 2:00 p. m. Luncheon
2:00- 4:00 p. m. The Neurological Basis for Treatment of Multiple Sclerosis
"Multiple Sclerosis" — Leo Alexander, M.D., Director, Multiple Sclerosis Clinic, Boston, Mass.
7:30- 9:00 p. m. General Session — House of Delegates

Thursday, June 23

9:00-12:00 noon "Some Research Problems in Physical Therapy" — Arthur L. Watkins, M.D., Assoc. in Med., Harvard Med. School, Chief of Phys. Med., Mass. Gen. Hosp., Boston, Mass.
Papers on Research — Graduate Students in Physical Therapy Schools — selection of papers to be announced
12:00- 2:00 p. m. Luncheon
2:00- 5:00 p. m. Arthritis
Subject to be announced — Walter Bauer, M.D., Mass. Gen. Hosp., Boston, Mass.
"Some Psychiatric Problems Related to Arthritis" — Alfred O. Ludwig
"Physical Therapy in the Treatment of Arthritis" — Mary L. Nesbitt, Supervisor, Phys. Therapy Dept., Mass. Gen. Hosp., Boston, Mass.
7:30 p. m. Concert — Boston "Pops"

Friday, June 24

9:00-12:00 noon Clinical Demonstrations
Main Amphitheater, Peter Bent Brigham Hosp.
"Fractures" — T. B. Quigley, M.D., Asst. Chief of Surgery, Peter Bent Brigham Hosp., Boston, Mass.
Auditorium — Massachusetts General Hospital
"The Beasley Electronic Myodynamometer" — Arthur L. Watkins, M.D., Assoc. in Med., Harvard Med. School, Chief of Phys. Med., Mass. Gen. Hosp., Boston, Mass.
"De Lorme Exercise Table" — Thomas De Lorme, M.D., Research Fellow, Dept. of Phys. Med., Mass. Gen. Hosp., Boston, Mass.
12:00- 2:00 p. m. Luncheon
2:00- 4:00 p. m. "Open House" in various physical therapy clinics in the Boston area

School Section Program, June 1949

Sunday, June 19th

11:00 A. M. "Brunch" (Copley Plaza)
- Introduction—Helen Kaiser, Chairman of Organizing Committee
- Welcoming Address—Helen Staats
- Business Meeting
  - Minutes
  - Report of Organizing Committee
  - Report of Committee on Education—Dorothy Baethke
  - Report of Educational Secretary—Barbara White
  - Nominations for Officers

Saturday, June 25th

9:30 A. M.-12:30 P. M. (Simmons College—Science Lecture Room 114)*
- Welcoming Address—John A. Timm
- Panel Discussion: Teaching Methods in Clinical Practice Supervision
  - Mary Nesbitt
  - Ila J. Amrhein
  - Beth Phillips
- Round Table: School Administration Problems in Relation to Clinical Practice
- Topics to be discussed: Basis for selection of facilities; extramural assignments at a considerable distance from the school; qualifications of supervisors; student remuneration in the form of board; meals, laundry, transportation costs, etc.; experience included under "clinical practice"; correlation of technics as taught by teaching staff and different clinical practice supervisors; extent and type of medical supervision.
- Moderator: Charlotte Anderson
- Discussants: Susanne Hirt, Janet B. Merrill, Margaret Kohli
- Election of Officers

2:00 P. M.-4:15 P. M.
- Patient Instruction: Methods of Teaching Students to Give Adequate Oral and Written Instruction to Patients and Parents—Margery Wagner
- Round Table: Means of Coordinating Diverse Student Backgrounds in Professional Education
- Discussants: Mary Macdonald, Floy Pinkerton
- Course Content—Ethics—Mary Haskell

*A luncheon will be served at Simmons College, June 25th. The cost will be $1.25. It will be necessary for all those planning to attend this luncheon to register at the conference so the necessary arrangements can be made.

Annual Banquet

The banquet this year is to be held on Tuesday night, June 21st. It will be *informal*. Cost—the same as last year—five dollars which includes gratuities and tax. Advance reservations may be made with Margaret Arey, 55 Queensberry Street, Boston 15, Mass. If you are not registering before Tuesday please make an advance reservation and send it together with five dollars to Miss Arey. (Reservation blank, page 147, this issue.) Your ticket will be waiting for you at the door or registration desk. Please state the school alumni group with which you wish to sit.

This year all alumni get togethers will be at the banquet. Tables will be marked appropriately and you will catch up on all the latest news of your fellow alumni. A cocktail lounge will be set up in the foyer so that the school groups may meet prior to the banquet if they so desire.

Do not miss the banquet. Miss Arey and her committee are planning a fine program. *Make your reservation in advance if you are arriving later than Monday.*

Pops

The Massachusetts Chapter has reserved a block of tickets for American Physical Therapy night at the Pops on Thursday night, June 23rd. The Boston Pops at Symphony Hall is a Boston *must*. There are three price tickets—$2.25 on the floor at tables which seat five. Make up a party—you may purchase refreshments—liquid or otherwise. Balcony $1.75 and $1.25. All with tax included. It will greatly assist the chapter if you will make advance reservation (reservation blank, page 147, this issue). It will save you time also.

Send in your reservation blank together with your money *now*.

Association Activities

1949-1950 Dues

All bills for dues will be sent from the National Office. This is a change authorized at the House of Delegates meeting, May 1949.

Active membership is $15. Two dollars will be returned to the chapter for each member of the chapter.

Inactive membership is $2. If a REVIEW subscription is desired an additional $3 will be necessary. If you are *not employed* as a physical therapist you may apply to the Executive Committee for in-

active status. Blanks are available in the National Office.

Associate membership is $5 and includes a subscription to the REVIEW.

Note to members overseas: You may indicate which chapter you wish to affiliate with or continue affiliation. If you expect to be returned to the States within the year, please indicate and your chapter dues will be held until your return and assignment in the States.

Members in Mississippi, Nevada, North and South Dakota: These are the only states without a chapter. Your chapter dues will be held pending chapter organization either within the state or together with a neighboring state.

New chapters are now being organized in Vermont, New Hampshire, New Mexico, Montana and Idaho. All chapter dues for members in these states will be held until organization is complete.

Transfer of membership from one chapter to another. Upon changes of residence or employment, request the secretary of your chapter to fill out a transfer blank which is provided by the National Office and send it to your new affiliation and to the National Office.

Polio Recruitment

The American Physical Therapy Association will assume responsibility for recruiting physical therapists for emergency work with infantile paralysis patients on May 1, 1949. The Executive Committee voted to do this at the semi-annual meeting upon request from the National Foundation for Infantile Paralysis. During the past two years the American Red Cross has recruited all emergency polio nurses.

Two things are evident:

(1) All qualified physical therapists are desirous of improving the quality of physical therapy for infantile paralysis as well as other types of patient care.

(2) If every member of the American Physical Therapy Association will cooperate we have an opportunity to raise standards of care and at the same time emphasize our place of responsibility in the community health program.

Two primary objectives are our goal:

(1) With our professional knowledge and information in our membership files we hope to make assignments for emergency polio work on the basis of fitting the recruit to the job.

(2) We wish to be used at the chapter and local level as professional consultants.

The whole program is dependent on your individual and chapter cooperation. The Executive Committee in accepting this responsibility had reason to believe that you will welcome this move.

Procedures for the Recruitment of Physical Therapists have been agreed on by the American Physical Therapy Association and the National Foundation for Infantile Paralysis. These call for determination of local need by the health officer, the hospital administrator, a representative of the National Foundation Chapter—preferably the chairman of the Medical Advisory Committee—and a representative of the American Physical Therapy Association who should be chosen by the chapter where possible, otherwise in nonchapter areas a person recommended by the National Office.

Beyond this it has been recommended that chapters be organized to provide consultation service where in-service training programs, planning for follow-up and home care are indicated and integration of emergency physical therapists into community and local chapter activities are important.

Many of you have worked as emergency polio physical therapists and we know that you have important ideas as to how the American Physical Therapy Association at national and chapter level can function in epidemic areas.

Do This Now

Chapters: Adopt a plan of action to coordinate your services in polio epidemic work with the National Foundation for Infantile Paralysis, state crippled children's agencies, medical and nursing organizations. Discuss how you can function and write National Office how they can assist you.

Members who have worked as emergency physical therapists—write National Office how you could have been helped in your situation through chapter or national consultation and planning.

Details of recruitment will be published at an early date. Salaries are $260 per month for staff physical therapists, $285 for supervisory and administrative positions. Travel expenses are paid plus $75 a month allowance for maintenance where it is not furnished by the institution and you are living away from home.

If you will be available for emergency work during 1949 notify the National Office: Polio Recruitment Service, American Physical Therapy Association, 1790 Broadway, New York 19, N. Y. By doing this immediately you will greatly assist us in planning our program so that we may fulfill requests for physical therapists in epidemic situations.

Legislation

Washington Chapter

Congratulations are in order to the Washington Chapter. HB#157, a bill to provide legal registration for qualified physical therapists, passed on

March 7th. The bill was written after a conference with Mr. McDavitt, Legal Advisor to the American Physical Therapy Association. Members of the Washington Chapter have devoted innumerable hours to the bill in addition to providing financial support through an assessment of the members.

81st Congress

Many bills concerned with medical care have been introduced into the 81st Congress. At present the major emphasis is still on compulsory health insurance, the Murray-Wagner-Dingell Bill S5 which has the support of the administration.

It is expected that a Taft-Smith national health bill will be introduced into the Senate very soon. This bill embraces the major points of the American Medical Association's proposed program.

One of the latest bills to be introduced is S1066 setting up a Federal Commission on Services for the Physically Handicapped. It was drafted by the American Federation of the Physically Handicapped and represents the final link in its proposed legislative program. The other bill previously introduced called for a national survey of the nation's physically handicapped and special control programs for epilepsy, leprosy and cerebral palsy. S1066 proposes to abolish the Office of Vocational Rehabilitation and transfer the functions to the Commission. It sets forth provision for maximum extension of medical services, education, training and full employment opportunities for the handicapped. Further comment will be made following a study of this bill. It can be said that the implemental value of the program in the proposed bill would be extremely high.

First Western International Conference of Occupational and Physical Therapists

The occupational and physical therapists of Washington and British Columbia extend a cordial invitation to all physical therapists to attend this joint conference of the two professional organizations in Vancouver, British Columbia, May 28 to 30, 1949.

The theme of the conference is present trends in occupational and physical therapy. This theme will be the basis of the program which will be presented by physicians, occupational and physical therapists from Canada and the western United States who are participating in new or expanding fields of occupational and physical therapy.

The conference will begin with registration at 8:30 A.M. daylight saving time at Shaugnessy Hospital in Vancouver. Morning meetings will be held here. Luncheon and dinner meetings with after-dinner speakers will combine the gracious hospitality of our Canadian hosts with educational presentations. Sunday will be reserved for sightseeing and afternoon tea. Monday morning tours of physical and occupational therapy departments will conclude the weekend of combined program and social events. The registration fee which includes the price of Saturday and Sunday luncheon, dinner and tea will be $7.

We hope that many physical therapists will plan to combine a Memorial Day holiday with this conference. Hotel reservations will be made for you by the committee if you will write to Miss J. M. Forbes, Occupational Therapy Dept., Shaughnessy Hospital, Vancouver, B. C., Canada, before May 10, 1949. You will be notified of the hotel to which you have been assigned and should receive confirmation of the reservation directly from the hotel. Do plan to join us!

Membership News

Catherine Worthingham Awarded Honorary Degree

At a special annual Founders' Day Convocation in Boston on March 14, 1949, Boston University conferred academic honor on Catherine A. Worthingham, a director and past-president of the American Physical Therapy Association. The citation made by President Daniel L. Marsh read as follows:

"Catherine A. Worthingham, Director of Professional Education of the National Foundation for Infantile Paralysis, Inc.; distinguished authority in fields of vocational rehabilitation, occupational therapy, physical therapy, and corrective physical education: because of your consecration of expert knowledge to the service of the physically unfortunate and handicapped, full many a healed cripple

Miss Worthingham receiving her degree.

may rise up to call you blessed, — I confer upon you Boston University's honorary degree of *Doctor of Science*."

Miss Worthingham is a graduate of Pomona College; Master of Arts degree, University of Southern California, 1931. Her career as a physical therapist and leader in corrective physical education work began in California where she was successively a high school teacher; on the staff of the Orthopedic Hospital, Los Angeles, Calif.; San Jose State College, Calif., and Leland Stanford University, 1937-47, having been Director of Technical Education there in 1944-47 when she joined the National Foundation for Infantile Paralysis in her present capacity. Miss Worthingham has been very active in national leadership, served as advisor in physical therapy to the Office of Vocational Rehabilitation, Federal Security Agency; as a member of the Subcommittee on Clinical Research of the Baruch Committee on Physical Medicine, and chairman of the Scholarship Committee of the Rosenburg Foundation. She received the National Association Honor Award Fellowship in 1945. She is an extensive writer in her field.

Physical Therapy at the Leprosarium

The following letter, dated January 23, 1949, was received by physical therapists in the State of Washington from Eva Laughlin, physical therapist at the U. S. Marine Hospital, Carville, Louisiana:

Here at last is the letter I promised you when I left Seattle last August. It is going to be mainly a series of facts without many details — otherwise the letter would be too long — and if you want more details you can write to me.

The U. S. Marine Hospital at Carville, La., is the only Leprosarium in the United States. It is located about 25 miles from Baton Rouge and about 80 miles from New Orleans. I can almost throw a stone from my window into the Mississippi River.

This station contains from 350-400 acres and includes on the staff's side, a golf course, a swimming pool, homes for the staff and their families, an administration building, a dining hall, a convent for the nuns—Sisters of Charity—who are the nurses here, a materiel office and store room, laundry, power house and dairy. The patient's side contains a golf course, a baseball diamond with lights for night playing, tennis courts, basketball court, recreation hall, cafeteria, dormitories where each patient has a private room, cottages where some married couples live, Protestant and Catholic churches, an infirmary of 60 beds, a jail, and a cemetery.

They have had a physical therapy department here for 20 years but they have never had a trained physical therapist before. The department has two rooms: one for hydrotherapy—whirlpools and contrast baths; the other room contains infra-red lamps, diathermy machines, exercise equipment, and a G. E. Variable Frequency Wave Generator for muscle testing and stimulation.

The staff consists of two men helpers (patients) whom I'm teaching to do various types of treatments—mainly massage and exercises—and myself.

Most of my work has been on hands in various stages of paralysis due to the peripheral nerve lesions of Hansen's Disease (the official name for Leprosy). These nerve lesions occur mainly in the ulnar, median, and peroneal nerves and cause anesthesia first and then involve the intrinsic muscles of the hands and feet and often cause claw-hands and drop foot.

The treatment consists of some form of heat, massage, exercise, muscle training, and electrical muscle stimulation. As a precaution, I wear rubber gloves when I massage.

We treat about 20 patients a day, but have to spend quite a lot of time on each patient as nearly all are involved bilaterally.

We are going to have an occupational therapist later on. She will be able to take a lot of the exercises off my hands and leave me more time for other things.

I don't get to the city very often as we are quite isolated out here, but so far I haven't had any trouble with time on my hands. In fact, I don't seem to have enough time off-duty. I'm teaching square dancing and some ballroom dancing to both staff and the patients, which takes quite a bit of my time, but I like it.

I don't dare make this letter any longer, so if you want any more details, write to me and I'll try to give them to you.

It was good to see Rury Bergstrom in New Orleans a week ago. If any of the rest of you come through this part of the country come to see me.

Marriages:

Odessa Richards of Indianapolis, Indiana, is now Mrs. Odessa Harris.

Patricia Dias of Columbus, Ohio, is now Mrs. Patricia Binder.

Anna Romer of Holly, Colorado, is now Mrs. Anna Bradshaw.

Blanche Zion of Everett, Pennsylvania, is now Mrs. Harold Slutzher.

Phyllis Blethen of Brooklyn, New York, is now Mrs. Phyllis Sharpe.

Frances Gill of East Orange, New Jersey, is now Mrs. Frances Marcell.

Doris B. Wartman of Cincinnati, Ohio, is now Mrs. Doris Hall.

Jane Carroll Flanagin of New York, New York, is now Mrs. Jane Grant.

Sara Elizabeth Kelley of Vallejo, California, is now Mrs. Sara K. Marcum.

Frances Schwartz of West Hartford, Connecticut, is now Mrs. Philip Feltman.

Katherine Osterbur of Milwaukee, Wisconsin, is now Mrs. Katherine Frank.

Helen Sprinkle of Cheyenne, Wyoming, is now Mrs. Helen Fuller.

Velma Locke of Pueblo, Colorado, is now Mrs. Charles Gallaher.

Edna Gould, of Springvale, Maine, is now Mrs. Edna Dwyer.

Alma Soderholm of Springfield, Massachusetts, is now Mrs. Eugene R. DeVine.

Ruth Chatfield, Lake Tahoe, California, is now Mrs. Ruth Droste.

Isabel Berry of Charlotte, North Carolina, is now Mrs. Henry F. Sigmon.

Katherine Raths of Bozeman, Montana, is now Mrs. Katherine E. Dorris.

Anna Wallace of San Francisco, California, is now Mrs. Anna Cocklin.

Marion Rosen of Berkeley, California, is now Mrs. Marion Coath.

Verna L. Sebring of Lake Stevens, Washington, is now Mrs. Verna S. Hisey.

Chapter Activities

• *Carolina Chapter:* The annual meeting of the Carolina Chapter and a symposium on physical medicine was held April 23 and 24 at the North Carolina Baptist Hospital and Bowman Gray School of Medicine. The program consisted of "Emotional Problems of Cerebral Palsy" by Dr. Richard Masland; "Psychiatry in Physical Therapy" by Dr. Angus Randolph; "Paraplegias" by Dr. Eben Alexander. Miss Mary Haskell of New York served as coordinator for the round table discussion of allied professions in a program for the physically handicapped, and Dr. Josephine Buchanan of the Virginia Rehabilitation Center, Fisherville, Va., served as coordinator for the second part of the round table discussion. Dr. Robert Lawson, Associate Professor of Pediatrics, Bowman Gray School, spoke on "New Developments in the Treatment of the Acute Stage of Poliomyelitis" at the banquet on Saturday night.

• *Virginia Chapter:* The March meeting of the Virginia Chapter was held in the recently reconditioned Memorial Hospital, the new home of the Baruch Center of Physical Medicine. A review of the school activities was presented by the students to the members of the Physical Therapy Club of the Richmond Professional Institute. This was followed by a program on "Multiple Sclerosis" which was most interestingly developed by Dr. Rene Cailliet of the Kabat-Kaiser Institute in Washington and Dr. Benedict Nagler and Mr. Robert Zarbock of McQuire Veterans Hospital of Richmond. Members and guests thoroughly enjoyed the students' tea which climaxed the meeting.

New Members

• The following are newly accepted members of the American Physical Therapy Association:

W. Herbert McDonald Dorothy Richards

• Newly accepted *student* members from the following schools:

Baruch Center of Physical Medicine:

June L. Morton Helen Weber
Gladys A. Park

Children's Hospital, Los Angeles:

Mrs. Violet H. Steinman

Columbia University:

Mr. Hyman Dervitz Celeste Nodell
Rudolfa Hanakova

Mayo Clinic:

Mrs. Jean D. Laufer

Simmons College:

Margaret O. Camp Priscilla A. Lewis
Rosamond Glass Helen Paytok
Barbara Harnden Joy F. Squatrito
Mabel King

University of Southern California:

Mrs. Auralie Finch Winifred J. Shultz

General News

Honorary Degree for Doctor Rusk

Howard A. Rusk, M.D., Professor and Chairman, Department of Rehabilitation and Physical Medicine, New York University College of Medicine; Chief of Rehabilitation Service at Bellevue Hospital, and Director, New York University-Bellevue Medical Center Institute of Rehabilitation and Physical Medicine, and Associate Editor, the New York Times, was awarded an honorary degree of Doctor of Science by Boston University at its special annual Founders' Day Convocation in Boston on March 14, 1949.

Commission on Chronic Illness

Carrying out another of the objectives of the American Medical Association's 12-point program for the advancement of medicine and public health, the Board of Trustees of the A. M. A. has made available $25,000 to set up the Commission on Chronic Illness.

The sum, drawn from the A. M. A.'s national education campaign fund, was allotted to the Interim Commission on Chronic Illness, which will set up the permanent commission. The A. M. A. also has provided office space at its Chicago headquarters to the permanent commission, representing voluntary agencies, government agencies, and the public.

Purpose of the commission will be to promote programs for the control of chronic illness in every state.

The patient with chronic illness is one of the major challenges to modern society. Sooner or later some form of long term illness affects one or more members in most families of the nation.

A conservative estimate suggests that more than one-sixth of the population is afflicted with some

chronic disease. Approximately 2,000,000 persons in the United States are chronic invalids at the present time, and the number is steadily increasing.

The commission is a joint project of the A. M. A., The American Hospital Association, the American Public Health Association, and the American Public Welfare Association, and was recommended by the Section on Chronic Disease of the National Health Assembly.

Dr. James R. Miller, Hartford, Conn., member of the Board of Trustees of the A. M. A., is chairman of the Interim Commission and will be a member of the permanent commission.

Correction

The article entitled "Integration of Principles of Body Mechanics and Posture in Nursing" by Margaret C. Winters which appeared in the February 1949 issue of the Review should have carried the following notation: "Aided by a grant from the National Foundation for Infantile Paralysis, Inc."

National Library on Handicap

One of the most complete libraries on the care and welfare of the crippled child and adult is maintained by The National Society for Crippled Children and Adults in Chicago*.

Staffed by professional librarians under the direction of Earl C. Graham, the library is a reservoir of pertinent data for the national staff and a source of authoritative information for state and local member societies.

The library also serves professional groups of physicians, social workers, nurses, and therapists, as well as physically handicapped persons and their families.

Approximately 30,000 pamphlets, reprints and manuscripts, 1000 reference books, and 300 professional periodicals are available.

A basic, general collection is maintained on all topics relevant to the problems of the crippled child and adult. Subjects comprehensively represented include: amputation, arthritis, cerebral palsy, congenital defects, crippling diseases, employment, hospitals and clinics for crippled children, legislation, mental hygiene, nursing, occupational and physical therapy, parent education, recreation, special education, speech correction, vocational guidance and rehabilitation.

No initial registration fee is required of borrowers and no charge is made for the circulation of materials. The literature is forwarded to inquirers in the form of 'package libraries' which may consist of books, periodicals, pamphlets or reprints. Borrowers are asked only to cover the cost of mailing or shipping.

The library receives between 150 and 200 letters of inquiry each month. Depending on the nature of the inquiry, the library forwards reference materials for a loan period of three weeks; supplies free copies of reprints or pamphlets; prepares and compiles special bibliographies; or sends the desired information in a letter enclosing, if necessary, abstracts from the books in the reference collection.

A monthly bibliography, BULLETIN ON CURRENT LITERATURE, (Price, $1 per year) which lists and annotates from 75 to 100 current publications of special interest, is published by the Library. Prepared primarily for professional and voluntary groups and individuals who work with the handicapped, the bulletin may also be found in most large public and university libraries in the country.

Special bibliographies which the library compiles and distributes without charge include those on cerebral palsy, the deaf and hard of hearing, aphasia, selective employment, special education, recreation, and camping. All lists are kept current by the addition of supplements and new bibliographies are constantly added to those now in print.

*Located at 11 So. La Salle St., Chicago 3.

Bernard Baruch Honored

In recognition of the international influence of his activities in advancing the cause of physical medicine, honorary membership in the British Association of Physical Medicine has been granted to Mr. Bernard M. Baruch.

Stating that many members of the British Association on Physical Medicine have received help from the Baruch Committee, Lord Horder, Physician to The King and President of the British Association of Physical Medicine, said in his letter to Mr. Baruch informing him of this recognition: "The impetus and encouragement which your generosity has afforded physical medicine is of international importance."

National Foundation's "Message to Parents"

In 1947 and 1948 the National Foundation for Infantile Paralysis distributed their "Message to Parents" in the form of leaflets through the schools. A similar distribution this year would be a prohibitive expense, in view of the high incidence of poliomyelitis in 1948 which cost the National Foundation well over $17,000,000. Therefore, the assistance of editors has been sought to help reach parents with the following message of guidance and reassurance:

If Polio Hits Your Area This Year

Avoid crowds and new contacts in trains, buses or boats, if possible; avoid crowded places where you may be close to another's breath or cough.

Avoid over-fatigue, too active play, late hours, worry, irregular living schedules may invite a more serious form of the disease.

Avoid swimming in water which has not been declared *safe* by your health department.

Avoid chilling. Take off wet clothes and shoes at once. Keep dry shoes, sweaters, blankets and coats handy for sudden weather changes.

Keep clean. Wash hands after going to toilet and before eating. Keep food covered and free from flies and other insects. Burn or bury garbage not tightly covered. Avoid using another's pencil, handkerchief, utensil or food touched by soiled hands.

Quick Action May Prevent Crippling

Call Your Physician at once if there are symptoms of headache, nausea, upset stomach, muscle soreness or stiffness, or unexplained fever.

Take His Advice if he orders hospital care; early diagnosis and prompt treatment are important and may prevent crippling.

Consult Your Chapter of the National Foundation for Infantile Paralysis for help. Your Chapter (see local telephone book or health department for address) is prepared to pay that part of the cost of care and treatment you cannot meet —including transportation, after-care and such aids as wheel chairs, braces and other orthopedic equipment. This service is made possible by the March of Dimes.

Remember, facts fight fears. Half or more of those having the disease show no after-effects; another fourth recover with very slight crippling. A happy state of mind tends toward health and recovery. Don't let your anxiety or fear reach your children. Your confidence makes things easier for you and for others.

American Congress of Physical Medicine

The American Congress of Physical Medicine will hold its twenty-seventh annual scientific and clinical session Sept. 6 to 10, 1949 inclusive, at the Netherland Plaza Hotel, Cincinnati, Ohio. Scientific and clinical sessions will be given on the days of Sept. 6, 7, 8, 9 and 10, 1949. All sessions will be open to members of the medical profession in good standing with the American Medical Association. In addition to the scientific sessions, the annual instruction courses will be held Sept. 6, 7, 8 and 9. These courses will be offered in two groups. One set of ten lectures will consist of basic subjects and attendance will be limited to physicians. One set of ten lectures will be more general in character and will be open to physicians as well as to physical therapy technicians who are registered with the American Registry of Physical Therapy Technicians. Full information may be obtained by writing to the American Congress of Physical Medicine, 30 North Michigan Avenue, Chicago 2, Illinois.

Middle Atlantic Hospital Association

The Pennsylvania, New York and New Jersey chapters are holding a special meeting at the Middle Atlantic Hospital Association meeting on Friday, May 20th, at the Hotel Shelburne, Atlantic City. Betty Kelly of Philadelphia is chairman. An interesting program is being planned with opportunity for discussion groups in specialized fields.

Registration is at the Hotel Shelburne. Meetings start at 9:30 A.M. and continue until 4:00 P.M.

All members of the American Physical Therapy Association are cordially invited to attend.

Multiple Sclerosis Surveys

A survey of multiple sclerosis cases in four different parts of the country is being sponsored by Public Health Service and National Multiple Sclerosis Society. Its purpose is to determine incidence, prevalence and local distribution of the disease and to try to determine whether geography, climate or race are factors.

The first survey is being conducted in New Orleans. Others probably will be made in San Francisco, Boston and in rural and urban areas near the Twin Cities and Rochester, Minnesota. S. A. Surg. Leonard T. Kurland (epidemiologist, Field Studies in Mental Health, Mental Hygiene Division) is PHS representative on the cooperative project.

Name for "Adapted Physical Education" in the Public Schools

Members of the School Section of the American Physical Therapy Association will be interested to know the outcome of the quest for a suitable name for the physical education program emphasizing correction and prevention as it is carried out in the public schools. Fifty names were suggested by physical educators, physiatrists, physical therapists and others interested in the field. The four names receiving the largest number of votes were: (1) Adapted Physical Education; (2) Corrective Physical Education; (3) Individual Physical Education, and (4) Physical Reconditioning. However, there was no outstanding majority for any of the four names, although "Adapted Physical Education" and "Physical Reconditioning" were in the lead.

Because of the lack of unanimity of opinion, the Committee on Physical Education and Recreation in Rehabilitation of the American Association of Health, Physical Education and Recreation have taken the stand that further clarification and delimitation of the field must take place before an adequate term can be selected.

Women's Medical Specialist Corps

The Executive Council of the Association of Military Surgeons of the United States, which convened on January 27, 1949, authorized the establishment of two new sections of that organization: a Section of the Army and Navy Nurse Corps, and a Section of the Women's Medical Specialist Corps. Rear Admiral Joel T. Boone, (MC) United States Navy, President of the Association, appointed Colonel Emma E. Vogel as Chairman of the Women's Medical Specialist Corps Section.

The Association of Military Surgeons, organized in 1891 and incorporated by an Act of Congress in 1903, is a society whose membership is limited to officers, past and present, of the medical services of the United States Government. It is a medical society devoted to the specialties of military medicine, surgery and sanitation. It is the only organization in the United States that aims to bring together the work in this field of the various Federal medical services. There are several chapters of the Association scattered throughout the country. These chapters have their own governing bodies approved by the parent Association.

The Association maintains an office in Washington, D. C., where all business of the Association is transacted. The magazine, "The Military Surgeon," which is the official publication of this Association, is widely read throughout the world. Membership dues, five dollars a year, include subscription to the journal.

The opportunity of becoming a member of this outstanding organization will be of interest to all members of the Women's Medical Specialist Corps, whether in the Regular Army or Reserve Corps. Application blanks may be obtained by writing to "The Association of Military Surgeons of the United States," Army Institute of Pathology, Washington 25, D. C.

Index to Current Literature

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The Treatment by Physiotherapy of Children with Poliomyelitis at Queen Mary's Hospital, Carshalton. Sheila J. Absalom. Physiotherapy, February 1949.

Bacteriologic Studies by New Methods of a Major Epidemic of Poliomyelitis, 1947. Edward C. Rosenow. Journal Lancet, February 1949.

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A Portable Electrical Manometer Suitable for Continuous Indication of Peripheral Venous Pressures. Albert A. Pollack and Earl H. Wood. Amer. Heart J., December 1948.

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Rheumatoid Spondylitis in Industrial Medicine. James H. Thompson. Stanford Med. Bull., February 1949.

Rheumatoid Spondylitis: Its Early Diagnostic Features and Management. Richard Z. Query, Jr. J.A.M.A., March 12, 1949.

Transfusions of Blood from Pregnant Women for Rheumatoid Arthritis. Editorial, J.A.M.A., March 12, 1949.

Cerebral Palsy

Let's Prepare Them for Daily Living. George G. Deaver. Spastic Review, March 1949.

Eye, Ear, Nose and Throat

An Anatomical Reason for the Various Behaviors of Paralyzed Vocal Cords. Brien T. King and Ralph L. Gregg. Annals of Otology, Rhinology and Laryngology, December 1948.

The Role of the Shahan Thermophore in Ophthalmic Therapeutics. M. Hayward Post. Amer. J. Ophthalmology, February 1949.

Spectral Transmission of the Eye to Ultraviolet Radiations. V. Everett Kinsey. Archives of Ophthalmology, April 1948.

Miscellaneous

Atomic Energy in Medicine. John Z. Bowers. Amer. J. Psychiatry, November 1948.

Radioisotopes in Medicine. George M. Lyon. Military Surgeon, March 1949.

The Role of Physiotherapy in Obstetrics and Gynecology. V. B. Green-Armytage. Physiotherapy, February 1949.

Physiotherapy in Tanga, Tanganyika. Q. C. Brown. Physiotherapy, February 1949.

Some Biologic Aspects of Ultrasonics. J. F. Herrick. Arch. Phys. Med., March 1949.

An Evaluation of the Question of Anoxia in Fever Therapy. Edward E. Gordon, Robert C. Darling and Ethel Shea. Arch. Phys. Med., March 1949.

Nervous and Mental Diseases and Injuries

Multiple Sclerosis: General Consideration. Arthur J. Schwenkenberg. Medical Times, March 1949.

Electro Shock Therapy in Patients with Severe Organic Disease. Leo A. Kaplan and J. Dennis Freund. Illinois Med. J., February 1949.

Combined Coromine-Electroshock Therapy in the Treatment of Psychotic Excitement. Howard D. Fabing. Amer. J. Psychiatry, December 1948.

Ultraviolet Radiation

Ultraviolet Exposure from Germicidal Lamps. George M. Hama. Industrial Medicine, February 1949.

Spectral Transmission of the Eye to Ultraviolet Radiations. V. Everett Kinsey. Archives of Ophthalmology, April 1948.

Coming Meetings

Date	Organization	Place
May 18-21	Association for Physical and Mental Rehabilitation	Hotel New Yorker, New York, N. Y.
June 19-23	American Physical Therapy Association	Copley Plaza Hotel, Boston, Mass.
Aug. 23-27	American Occupational Therapy Association	Book-Cadillac Hotel, Detroit, Mich.
Sept. 6-10	American Congress of Physical Medicine	Netherland Plaza Hotel, Cincinnati, Ohio
Nov. 7-9	National Society for Crippled Children and Adults	Commodore Hotel, New York, N. Y.

Abstracts

John S. Coulter, M.D.

Brachial Neuralgia

John Shulman, M.B., D. Phys. Med., Physician in Charge, Department of Physical Medicine, Coventry and Warwickshire Hospital, and Department of Physical Medicine, Warneford Hospital, Leamington Spa, Coventry, England. In ARCHIVES OF PHYSICAL MEDICINE, 30:3:150, March 1949.

For the purpose of this paper my discussion will be confined to three causes of pain in the region between the neck and upper limbs: (1) pain associated with osteoarthritis of the costotransverse articulations of the first rib; (2) pain in the supraspinatus muscle; (3) pain associated with faults in the lower cervical portion of the spine.

Treatment of the conditions by short wave radiations or by other forms of heat often is very effective in alleviating pain, but Shulman is hopeful that some of the newer physical modalities, such as microwave radiations, may be more effectively focused on the abnormal area.

Whether breathing exercises would be an advantage or not in this condition is a debatable problem, as the advantage of increased mobilization of these joints may be counterbalanced by the disadvantage of forcing additional movements in a pathologic process already compensated by other methods of respiration.

Pain in the Supraspinatus Muscle

The location of the pain in both origin and insertion of this muscle seems to suggest a form of strain similar to that of tennis elbow. The condition often responds rapidly to heat therapy combined with injections of procaine into the regions of both muscular origin and tendinous insertion of the supraspinatus.

During the clinical investigation the patient often complains chiefly of pain in the outer border of the elbow and forearm, and Shulman finds that it is a wise precaution in all cases of suspected tennis elbow to examine the supraspinatus muscle and its tendon for evidence of deep pain.

Pain Associated with Faults in the Lower Cervical Portion of the Spine

This group of abnormalities is so similar to that found in the roentgenographic appearances of the lumbar portion of the spine in many painful conditions of the back and lower limbs that they seem to suggest a common origin, probably a congenital origin based on the failure of the tissues which form the vertebral laminae to complete their embryologic function of separating the notochord from its original connection with the ectoderm. The cervical and the lumbar portion of the spine are the last two places to complete this natural closure. It therefore may be debatable whether prolapse of a disk is partly the result of this congenital fault or not. There appears to be a tendency now to look upon prolapse of a cervical intervertebral disk as a condition for which surgical treatment is unlikely to be necessary.

For brachial neuralgia associated with prolapsed cervical invertebral disk traction of the cervical spine by means of Sayers suspension gear with the patient sitting in a chair is effective in some cases. Suspension for about two minutes, increasing to five minutes, is given daily and followed by gentle exercises of cervical spinal muscles.

In case of a prolapsed disk, a firm leather collar lined with soft leather can be worn after these exercises to prevent flexion of cervical spine, allowing the busy housewife to carry on with her household duties without fear of accidentally applying flexion strain to the cervical portion of the spine.

Rehabilitation of the Hand

Arthur M. Pruce, M.D., Atlanta. In THE JOURNAL OF THE MEDICAL ASSOCIATION OF GEORGIA, 38:2:49, February 1949.

Restoring useful function to a disabled hand that has been damaged by arthritis, trauma or paralysis is a medical problem of first importance. The social and economic implications of deformity and impaired function are obvious.

(1) The application of physical measures in rehabilitation of the hand must be guided by the reaction of the patient and the response of the hand.

(2) Massage is no substitute for active motion.

(3) With the exception of paralysis, passive movement of the fingers must be condemned.

(4) Early return to normal work procedures is the best type of occupational therapy.

Vocational Rehabilitation of Epileptics in Texas

John L. Otto, M.D., Galveston, Texas. In THE AMERICAN JOURNAL OF PSYCHIATRY, 105:6:417, December 1948.

Those associated with vocational rehabilitation in Texas have long realized that epileptics should be included in any state-wide program designed to aid the handicapped, feeling that many of these patients who were serious economic burdens to their families or the state could become self-supporting with the proper help. We further realized that education of employers and employment agencies, proper selection of jobs, adequate medical control of the seizure, and the cooperation of the local physician were essential before successful rehabilitation of the epileptic could be expected.

A special clinic had been established at John Sealy Hospital early in 1945 for the study and treatment of epileptics on an out-patient basis but no funds were available for vocational rehabilitation. With these two agencies cooperating a definite plan was mutually agreed upon.

The Effects of Massage on the Circulation in Normal and Paralyzed Extremities

Khalil G. Wakim, M.D., Ph.D., Gordon M. Martin, M.D., Jean C. Terrier, M.D., Earl C. Elkins, M.D., and Frank H. Krusen, M.D., Mayo Clinic, Rochester, Minn. In ARCHIVES OF PHYSICAL MEDICINE, 30:3:135, March 1949.

Accompanying the rapid expansion of the entire field of physical medicine, massage has become a method of treatment that is being used increasingly. It is gradually acquiring a scientific basis, with various accepted technics and definite indications and contraindications for its use. Although its clinical results are undoubted, the specific physiologic factors involved in achieving them have been somewhat difficult to determine.

The purpose of this study was to determine the effects on the blood flow in the extremities resulting from the standard deep stroking and kneading massage and also from vigorous, stimulating, kneading and percussion type of massage.

Two methods of massage were used in this study: The first was a modified Hoffa type of massage, employing deep stroking and kneading of the extremities, following the pattern of the large muscle groups. Massage of each extremity lasted for fifteen minutes. It was administered by physical therapists, all of whom had been trained in the same basic technic. The stroking and kneading were made at a uniform rate. The massage was primarily centripetal in direction. In each instance it was begun and completed with deep stroking of the entire extremity. A light mineral oil was used as lubricant. The second type of massage employed in this study was a vigorous, forceful, stimulating massage, employing extremely deep stroking, kneading and friction. The massage was applied to the upper extremities for a period of fifteen minutes and included the anterior and posterior aspects of the arm, the forearm, the hand and the fingers. The lower extremities were massaged similarly for a period of twenty minutes, and this massage included the lower third of the thigh, the leg, the foot and toes (anterior and posterior aspects). This second type of massage was administered by a physician (J.C.T.) trained in the methods of stimulating massage employed in some of the European schools of physical therapy and massage.

Analysis of the data obtained in this study indicates that deep stroking and kneading massage of either upper or lower extremities produces more or less moderate and often insignificant change in blood flow when compared with vigorous, stimulating massage. In subjects who had flaccid paralysis, deep kneading and stroking massage of the involved extremities seems to produce a significant increase of blood flow of the massaged extremity.

The vigorous, stimulating massage, as applied to the upper and lower extremities of normal subjects and to the lower extremities of patients who had flaccid paralysis, produced significant increases in the blood flow in 29 of the 33 massaged extremities. The average increase in blood flow was most marked in the extremities with flaccid paralysis. However, definite and significant increases in blood flow also were noted after the massage of normal extremities. Although this type of vigorous, stimulating massage results in a marked increase in peripheral blood flow in the extremities, it is not a type of massage that can be used routinely as a therapeutic procedure for treating most patients seen in a department of physical medicine. This type of massage can be traumatizing to flaccid muscles and other soft tissues if administered indiscriminately.

Summary and Conclusions

The effects of vigorous, stimulating massage and of a modified Hoffa type of deep stroking and kneading massage on the peripheral circulation in normal and diseased extremities were studied by means of the venous occlusion plethysmograph with the compensating spirometer recorder. The data obtained justify the following conclusions:

(1) There is no consistent or significant average increase in total blood flow after deep stroking and kneading massage of the extremities in normal subjects, in those with rheumatoid arthritis or in those with spastic paralysis of the extremities.

(2) There is a moderate, consistent and definite increase in circulation after deep stroking and kneading massage to the extremities of subjects who have flaccid paralysis.

(3) Vigorous, stimulating massage results in consistent and significant increases in the average blood flow of the massaged extremity.

(4) Neither deep stroking and kneading massage nor vigorous, stimulating massage of the extremities results in consistent or significant changes in the blood flow of the contralateral unmassaged extremities.

Comminuted Colles Fractures

C. K. Wier, M.D., Wichita, Kansas. In THE JOURNAL OF THE KANSAS MEDICAL SOCIETY, 50:2:60, February 1949.

Fracture of the distal end of the radius is one of the most frequent bone injuries which the physician is required to treat.

Following a comminuted fracture of the base of the radius, extensive hemorrhage and exudation occurs into all the adjacent structures, including the flexor and extensor tendons, carpal joint spaces, volar and extensor ligaments, fascia and subcutaneous tissue.

This leads to extensive adhesions and a frozen, shiny, useless hand if the fingers are immobilized. A finger which is kept moving does not become stiff. Weeks of physical therapy will not compensate for three or four weeks of immobilization of the fingers—during which time the extensor tendons and lateral ligaments of the metacarpophalangeal and interphalangeal joints become shortened and contracted, making flexion of the fingers impossible. This can be prevented if the patient is allowed to be his own physical therapist and urged to move his fingers and thumb through their normal range many times daily. The patient should be seen frequently during the first two weeks so that the physician may be sure the active motion of the fingers is being carried out. Light work is encouraged. The shoulder should be moved through a complete range of motion several times daily to prevent an adhesive capsulitis and fixation of the shoulder in adduction. It does happen in the older group.

Reconstruction of Thumb by Transposition of Adjacent Digit

R. C. Tanzer and J. W. Littler. In PLASTIC AND RECONSTRUCTIVE SURGERY, 3:517-632, September 1948. Abstracted in JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 139:9:607, Feb. 26, 1949.

According to Tanzer and Littler a satisfactory reconstruction of the thumb should meet three criteria: (1) sufficient forceful flexion and extension to permit grasping, (2) opposability of the tip of the reconstructed thumb to the pulp of at least one digit and (3) tactile sensation at its tip. The authors describe a method for the reconstruction of subtotal or total loss of the thumb, which meets these requirements. They present 7 cases in which this method was used. In most cases the transposition of an adjacent digit to thumb position requires the use of a pedicle flap to close the intervening defect. It is preferable to perform the transposition and the bony fusion in separate stages in order to obtain a more accurate positioning of the reconstructed thumb. Following fusion, further revision in the nature of tendon transfers and grafts or shortening of the tip frequently is necessary. A damaged digit often can be more effectively employed in reconstructing a thumb than in attempting to restore its useful function as a finger.

A Guide for Labeling of Infra-Red Heating Devices

Council on Physical Medicine. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 139:14:923, April 2, 1949.

With the establishment of physical medicine as a recognized medical specialty, qualified physicians in this field must assume some responsibility in the protection of the general public from false or misleading claims made in conjunction with devices which are becoming increasingly available. The Council on Physical Medicine of the American Medical Association is responsible for censorship of such claims made in regard to physical devices primarily intended for sale to physicians. The Food and Drug Administration of the Federal Security Agency, moreover, has the responsibility for protecting purchasers from misbranded or dangerous devices and drugs. The excellent progress already made in the field of drug therapy regarding high standards of labeling and accurate allowable therapeutic claims is largely due to the expert assistance which has been accorded the Food and Drug Administration by the various medical specialty groups. It is to be hoped that similar high standards for labeling and therapeutic claims for physical devices might be obtained through the provision of the Federal Food, Drug and Cosmetic Act and the counsel and advice of specialists in physical medicine.

An immediate problem at hand has arisen through the wide-spread distribution and use by the lay public of infra-red heating devices. Many of the reputable manufacturers of infra-red heating lamps have continued to maintain high standards in their labeling and therapeutic claims in connection with their products, and it is expected that they will continue to maintain these high standards. Unfortunately, however, the general public is being continuously bombarded by advertising and labeling from manufacturers of heating lamps in which a host of therapeutic claims are made, many of which are open to serious question. Aside from being marketed with false and misleading therapeutic claims, many of these lamps are not supplied with adequate directions for use, and the inherent dangers of indiscriminate use of heating devices are obvious to the trained physiatrist. In view of this serious situation, the Committee on Cooperation of the American Congress of Physical Medicine with the Food and Drug Administration, in conjunction with the Council on Physical Medicine, has attempted to set up a minimal guide for labeling of infra-red devices based on the medical facts available from experts in this field.

It is the consensus among physiatrists that infra-red heating is in no way a specific therapy. It is felt that such standards as are applied to nonspecific drugs regarding therapeutic claims should be utilized also as a model for therapeutic claims for infra-red heating devices sold generally.

It also is the consensus of the committee and other physiatrists consulted that the use of the terms "penetrating" and "deep" used in the labeling of infra-red heating devices definitely is misleading. When these terms are employed in conjunction with therapeutic claims for relief of muscular aches and pains, experience shows that the uninformed general public is misled into the belief that this radiation penetrates to the site of the involvement. Although it is well known that certain portions of the infra-red spectrum can pass through tissues to a greater extent than others, the penetration even with the shortest infra-red radiation is measured in millimeters. In view of this degree of penetration, and since we have effective means for deep heating by diathermy, and since the term "deep therapy" is used in conjunction with roentgen radiation, where depths of many centimeters of penetration are obtained, it is felt that these two terms are misleading and should not be employed in the labeling of infra-red devices.

To insure maximum protection of the general public in the use of physical devices, it is essential that the labeling contain adequate directions for use and adequate warnings against misuse. In a survey of representative labeling of infra-red heating lamps it is apparent that many manufacturers fail to include adequate directions and precautions. The committee believes that adequate directions should include the minimum safe distance at which the lamp should be placed, in order to provide a comfortable warmth. It also is advised that adequate warnings should be set forth against the unattended use of infra-red heat for children, debilitated persons, over anesthetic skin areas or in the presence of poor circulation.

Such gross mislabeling of physical devices as exists today reflects poorly on the status of physical medicine as a responsible medical specialty. The physiatrist should assume the responsibility for lending expert counsel to the Food and Drug Administration in cooperation with the Council on Physical Medicine in its efforts to obtain suitable standards for labeling of all physical devices for sale to the general public.

The Use of a Cold Room in Treatment of Hyperpyrexia and Burns

Herbert R. Brown, Jr., M.D., and Vincent De Lalla, Jr., M.D., Rochester, N. Y. In ARCHIVES OF PHYSICAL MEDICINE, 30:2:98, February 1949.

Interference with the ability of the human body to lose heat will result in hyperpyrexia, which may be fatal unless effectively treated. Such a situation was present in the case of a patient with 50 per cent of his skin area burned and with pressure bandages over 85 per cent of his total surface area.

The extreme elevation of body temperature in the case described was easily and quickly lowered to normal range and then maintained at levels below 101 F. by placing the patient in a cold room, which is described.

The value of a controlled environmental chamber is shown, with especial reference to its use in tropical and subtropical zones. The usefulness of such a room to both military and civilian hospital facilities is noted.

Dissociation Between Pain and Temperature in Spinal Cord Lesions

I. C. Sherman and A. J. Arieff. In JOURNAL OF NERVOUS AND MENTAL DISEASE, 108:271, October 1948. Abstracted in JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 139: 10:672, March 5, 1949.

Sherman and Arieff point out that in most textbooks of neurology and neuroanatomy it is generally stated that the fibers of the lateral spinothalamic tract convey the sensations of pain and temperature, leaving the impression that both modalities are conveyed in the same tract and that they suffer simultaneously in disease. The diagnosis of hysteria at times had been erroneously attached to a patient who suffers only the loss of pain sensation with preservation of temperature sense and vice versa. These misunderstandings exist in spite of the fact that there are definite contributions in the literature to indicate that these modalities may be lost differentially by lesions in the spinal cord. The authors present 4 cases which represent instances of dissociation of pain and temperature sense in intramedullary and extramedullary spinal cord disease. In the first case, temperature sense was present but diminished in areas of analgesia in two separated dermatome areas as a result of syringomyelia. In the second case, there was loss of temperature sense in an area where pain sense was well preserved in an intramedullary lesion. Because of this one may postulate separate pathways for pain and temperature. The third case showed preservation of temperature with loss of pain in the presence of extramedullary compression. The fourth case shows loss of pain and cold perception with preservation of warmth perception as a result of an intramedullary lesion. The authors conclude that the functional anatomy of the spinothalamic tract still is not completely understood.

The Care of Hand Injuries

Prepared by the American Society for the Surgery of the Hand. In RHODE ISLAND MEDICAL JOURNAL, 32:1:36, January 1949.

After-treatment consists of:

(1) Elevation and rest of the hand.

(2) Noninterference with initial dressing for a sufficient time to permit healing, unless evidences of suppuration develop.

(3) Restoration of skin coverage of denuded areas at earliest possible time. Partial thickness skin grafting is a simple and valuable means of promoting early healing.

(4) Early restoration of function for nonaffected parts of the hand by directed active motion to the fullest extent that will not jeopardize healing of repaired structures.

(5) Restoration of function in affected parts of the hand by directed *active* motion as early as is consistent with full healing and preservation of the repair of damaged structures.

New Concepts of Regeneration of Peripheral Nerves

Frederick Hiller, M.D. In QUARTERLY BULLETIN OF NORTHWESTERN UNIVERSITY MEDICAL SCHOOL, 23:1:50, Spring Quarter, 1949.

Regeneration of peripheral nerves may proceed within the original mesodermal channels, i.e., the endoneural tubes whereby, as a rule, prompt and complete restitution of function is accomplished. This type of regeneration is called "isomorphous neurotization" and is characterized by the fact that each individual axon regenerates within its proper mesodermal sheath. Contact between ganglion cells and their appropriate peripheral end-organs becomes reestablished. Examples of isomorphous neurotization are to be found in those nerve lesions, which, although they interrupt the continuity of the axis-cylinders, do not disturb the structure of the mesodermal nerve stroma.

Regeneration of peripheral nerves may take place within a proliferating mesodermal tissue resulting from interruption, not only of the axis-cylinders, but also of the mesodermal endoneural tubes. This type of regeneration, called "heteromorphous neurotization," is characterized by the fact that the nerve fibers which regenerate in the protoplasma of proliferating Schwann cells follow the lead of fibroblasts and their collagenous fibers. Thereby a new, heteromorphous structural pattern is created, in which the original connection between ganglion cells, axons and their peripheral end-organs frequently is lost. In this process, many regenerating nerve fibers may be led astray and prevented from establishing contact with the nerve segment distal to the injury. In such cases restitution of function is delayed and incomplete. Examples of heteromorphous neurotization are found in severe nerve contusions, nerve sutures and nerve grafts, particularly of the homogenous variety.

Occupational Therapy

Lawrence F. Woolley, M.D., and Rives Chalmers, M.D., Atlanta, Ga. In AMERICAN JOURNAL OF PSYCHIATRY, REVIEW OF PSYCHIATRIC PROGRESS 1948, 105:7:536, January 1949.

Occupational therapy has kept pace with other phases of psychiatric treatment in expanding facilities, increasing personnel, and presenting more adequate and varied programs for therapy in psychiatric hospitals. Units to provide occupational therapy facilities in general hospitals have been opened, and although many of these are still quite new it is obvious that there will be increasing recognition of the value of occupational therapy as an adjunct to treatment of all phases of physical and emotional illness. There were, in this country before the war, 9 schools offering training in occupational therapy; now there are more than 20. Schools have been opened in Australia, Czechoslovakia and India by American personnel. Other countries are contemplating establishing schools.

The rehabilitation programs both through the Federal and State Governments and the Veterans Administration have continued to expand and are helping more persons with psychiatric disabilities. There is still a great shortage of trained therapists.

Physiatrist-Medical Coordinator

Ben L. Boynton, M.D., Chief, Physical Medicine Rehabilitation Division, Veterans' Administration, Branch 10, Dallas, Tex. In THE CRIPPLED CHILD, 26:5:6, February 1949.

The physiatrist should not be expected to perform the functions that are properly those of the social service worker, the vocational advisor, the educationalist, the psychologist, the occupational or physical therapist; nor should he be expected to perform the functions of the orthopedist or the pediatrician. The physiatrist's position is that of a medical coordinator, who by virtue of the fact that he is a physician can, in actuality, follow the patient from the bedside through convalescence to the school desk or work bench as the case may be.

There has been and continues to be considerable pressure toward provision of more adequate training facilities for therapists. It would be well to keep in mind that the therapists look to the medical profession for guidance, and it is imperative, therefore, that increased efforts be exerted toward the training of more physicians in Restorative Medicine if we are to achieve the goal for which we are all striving—maximum rehabilitation and restoration of the handicapped.

This article was accompanied by an illustration entitled: "Physical therapists make an electrodiagnostic examination of patient with peripheral nerve injury to determine extent of nerve damage."

Physical Medicine and Preventive Medicine

J. Wayne McFarland, M.D., Washington, D. C. In SOUTHERN MEDICAL JOURNAL, 42:1:29, January 1949.

Physical medicine, the newest specialty of medicine, is in a unique position. It has the opportunity of building upon the broad base of medical and surgical specialties now well established, and at the same time brings to the field of medical research the new and tremendously important basic science, biophysics.

Physical medicine has been defined as the employment of physical and other effective properties of light, heat, cold, water, electricity, massage, manipulation, exercise and mechanical devices in physical and occupational therapy for the purpose of diagnosis and treatment of disease. Rehabilitation is the newest phase added to the everexpanding specialty of physical medicine.

In summary, may we say that we have not attempted to cover the whole field of physical measures and their place in preventive medicine, nor may we have chosen the best examples. There are many others to be sure. However, we heartily agree with Earl C. Elkins, of the Mayo Clinic, who says:

> "I think that, by all means, we should encourage the use of physical measures in preventive medicine, particularly in relation to postural deformities."

Our purpose has been to point out that physical measures have a most definite place in the prevention of disease, and we feel that the definition of physical medicine should more correctly read: physical medicine may be defined as the employment of physical and other effective properties of light, heat, cold, water, electricity, massage, manipulation, exercise and mechanical devices in physical and occupational therapy for the purpose of prevention, diagnosis and treatment of disease.

The Effects of Therapeutic Exercise on the Peripheral Circulation of Normal and Paraplegic Individuals

Khalil G. Wakim, M.D., Ph.D., Earl C. Elkins, M.D., Ralph E. Worden, M.D., and Howard F. Polley, M.D., Rochester, Minn. In ARCHIVES OF PHYSICAL MEDICINE, 30:2:86, February 1949.

Therapeutic exercises of various grades of severity and duration were given to normal and to paraplegic persons, and their effects on the circulation in the extremities were studied by means of the venous occlusion plethysmograph with a compensating spirometer recorder. A comparison was made of the effects of the exercises on the circulation in the normal and in the paralyzed extremities. In the normal subjects, the exercised upper extremities showed an average increase of 146 per cent in blood flow of the left arm and of 110 per cent in the right arm. Exercise of the upper extremities of normal subjects produced an average increase of 22 per cent in the blood flow of the left leg and 45 per cent in the right leg.

Identical exercises given to paraplegic subjects produced similar increases in blood flow in the upper extremities. The average increase was 170 per cent in the left arm and 135 per cent in the right arm. The paralyzed lower extremities of some subjects showed slight decreases and slight increases but neither change was marked.

After several weeks of rehabilitation, during which therapeutic exercises were performed regularly, the normal extremities showed a definite and uniform increase in the circulation, while the effect on the paralyzed extremities was not uniform.

When exercise of one upper extremity consisted in lifting of a heavy weight (40 pounds), the contralateral unexercised upper extremity showed a good increase in blood flow immediately after the exercise; whereas when the weight lifted was only 20 pounds, even though the duration of the exercise was doubled, the increase of blood flow in the contralateral unexercised extremity was insignificant.

When the effects of supervision and no supervision were compared, it was observed that in every case the percentage increase in blood flow in the tested extremities was greater when exercise was carried out under medical or technical supervision than when it was not supervised.

A National Health Program for America's Hospitals: A Statement of the American Hospital Association in Regard to Hospital Care—A Resolution Adopted by the House of Delegates at Cleveland, October 1944

Joseph G. Norby, President, American Hospital Association. In THE JOURNAL OF THE AMERICAN HOSPITAL ASSOCIATION, 23:1:38, January 1949.

The American Hospital Association must continue to promote the best possible hospital care for the American people and to assist in making such care available to all.

Therefore, the American Hospital Association presents the following statement of policy regarding hospital care:

I. Ideals of the American Hospital System.
   a. To render the best possible hospital care.
   b. To make hospital care readily available in all areas and to all people.
   c. To improve constantly standards of hospital care.

II. The Hospital's Responsibility as a Community Health Center.
   a. Care of the sick—provision of the latest diagnostic and therapeutic services.
   b. Education—physicians, nurses, personnel and public.
   c. Research—medical care and hospital management.
   d. Participation in a program of preventive medicine.

III. Present Program of the American Hospital Association.
   a. Preservation of the values of the voluntary hospital system.
   b. Local, county, state and federal government aid for the care of the indigent with emphasis on local participation.
   c. Government aid for public and voluntary hospital construction upon evidence of unmet needs.
   d. Extension of voluntary budgeting for the cost of medical and hospital care.
   e. Extension of interhospital coordination and cooperation both urban and rural.

The American Hospital Association realizes that the existing hospital system does not fulfill completely and perfectly the hospital needs of the American people. It urges that every hospital be alert to the needs of its community. It further recommends a careful analysis of existing deficiencies and urges action to meet them progressively.

The American Hospital Association urges that as a program is developed for the realization of universal availability of hospital care the following factors be borne in mind:

1. That it be based upon evidence of unmet needs which the changes will fulfill.
2. That it be convenient and economical, utilizing to the greatest possible degree existing resources, motives and organizations.
3. That consideration be given to all other factors which affect individual and public health.
4. That the program of evolution attack the most pressing problems.

The American Hospital Association warns against decisions based upon administrative expediency and therefore believes that, as in other forms of human endeavor, continued improvements can and will be made in hospital service for the American people. In all these matters so vitally affecting the well-being of the population great caution should be taken at the same time to preserve American tradition and the spirit of individual initiative and enterprise.

Geriatric Rehabilitation

Trevor H. Howell, M.R.C.P. Ed., Physician, Geriatric Unit, St. John's Hospital, Battersea, London, Lecturer in Problems of Old Age, St. Bartholomew's Hospital, London. In OCCUPATIONAL THERAPY AND REHABILITATION, 27:6: 468, December 1948.

A large number of elderly patients are wrongly considered as untreatable, and therefore neglected. Yet much may be done to restore cases of apparent senility and incurable disease to relative vigour in body and mind. Complete recovery is not possible in all patients, but once a planned system of rehabilitation is in being, some surprising results can be obtained.

The first essential in treating the aged is an optimistic atmosphere. This has a greatly stimulating effect on the patient and also on the relatives. It is important to gain the active cooperation of both if real success is to be achieved. No one can do much against the patient's will. In the same way, it is fatal to keep the old people in bed and to give them sedatives. The practice should be to get them up and to keep them interested.

The practice at St. John's Hospital is to encourage as many patients as possible to get up out of bed. The question asked of any disability is not "what is wrong?" but "why can such and such a function not be performed?" All excuses for immobility are approached in this spirit and a remedy sought at once. The results are sometimes surprising.

Although a start has been made, much remains to be done in this field. The problem of contractures, for example, remains unsolved. The rehabilitation of those previously considered as incurable is going to be one of the great adventures in the future.

Some Metabolic Observations During and After Exercise in Patients Convalescing From Acute Illnesses

Robert C. Darling, M.D., with the technical assistance of Ethel Shea, A.B., New York. In ARCHIVES OF PHYSICAL MEDICINE, 30:2:71, February 1949.

The psychologic factors in convalescence often are so dominant that tests depending heavily on voluntary effort are difficult to interpret. For this study patients were chosen who had self-limited medical illnesses. Each patient was subjected to a series of measurements at rest, while performing a simple standardized exercise for five minutes (level walking) and during the twenty minutes recovery from the exercise. This procedure was carried out on the first or second day out of bed and again two to eight weeks later, after full convalescence. The latter tests served as individual controls. Complete data were collected on eight subjects. Measurements included metabolism by the collection and analysis of expired air, pulse rate, blood lactate and blood sugar.

The oxygen consumption at rest and during the exercise and oxygen consumption during recovery (or oxygen debt) were all unaffected by the convalescent state.

Likewise the blood sugar values were not affected.

The pulmonary ventilation at rest and in recovery from exercise was higher (10 to 15 per cent) in convalescence than in control measurements, but ventilation during exercise was unchanged.

Increase in pulse rate at rest and after exercise in the convalescent subject was less striking and less regularly observed than might have been expected from previous work on physical fitness. The mean pulse rate was 6 beats per minute faster at rest, 16 beats faster in exercise, and 10 to 13 beats faster in recovery than it was later after full convalescence.

Changes in blood lactate were the most striking and interesting observed. The lactate at rest of the recently ill subject was significantly higher than some weeks later; it tended to fall slightly during exercise where it persisted, whereas on control observations it remained constant during and after exercise. Although all these measurements were within the accepted normal range, the differences were clear-cut and may point to a fundamental chemical slowing associated with illness and inactivity.

Our hopes of finding a simple index paralleling the asthenia of convalescence have not been fulfilled. Perhaps the few deviations observed may be useful in searching further.

The Effect of Ultraviolet Radiation and Air Conditioning Upon the Air Sterility in a Closed Surgery

Julien M. Goodman, M.D., Mary B. Cass, B.Sc., Karl P. Klassen, M.D., and George M. Curtis, M.D., Columbus, Ohio. In SURGERY, 25:2:284, February 1949.

(From the Franklin County Tuberculosis Hospital and the Department of Research Surgery of The Ohio University.)

Summary

(1) Studies were made in a closed surgery to determine the efficacy of ultraviolet radiation upon the sterility of the air, and the contamination produced by operation of an air-conditioning unit ventilating the room through a small screen grid 17½ by 8 inches, located 7 feet above the floor in the middle of one of the side walls just above an ultraviolet lamp.

(2) Studies of the degree of contamination at floor level and at operating-table level were made. Classification of air and skin contaminants as well as of molds was made and the resultant percentages tabulated.

Conclusion

Air conditioning without any means of filtering the inlet increases the air contamination in a closed room. The contamination at various levels in a room is not appreciably affected by air conditioning. Ultraviolet radiation in a closed room exerts a beneficial effect on the relative sterility of the air by reducing the quantity of air contaminants equally at all levels. It is possible that by a finer screening device, or by the use of ionization further to cleanse the air before it is injected into a room, the contamination might be still further lessened.

Low Back Pain: The Psychosomatic Viewpoint — A Psychosomatic Study on Increased Muscle Tension of the Voluntary Musculature as a Factor in the Production of Low Back Pain and in the Pathogenesis of Atrophic and Hypertrophic Arthritis of the Spine — A Preliminary Report

Alfred P. Solomon, M. D., Chicago. In INDUSTRIAL MEDICINE, 18:1:6, January 1949.

The author has indicated the relative ease in which a representative group of male and female patients were induced to give up their conversion symptoms with a psychoanalytically oriented psychotherapy, associated with psychodynamically oriented prescribed recreation and exercise therapy. This treatment reverses those untoward factors in the patient's environment which encouraged the development of the conversion response. It gives him an authoritative figure he can trust rather than fear, and by so doing affords an outlet for aggressions in play rather than work. Characteristic of the patient's response to this treatment has been the rapidity with which the symptoms can be reversed. Clinically this could be described as hypersuggestibility. Study of this response reveals, however, that it is an unconscious gratification of passive, submissive wishes to an authoritative figure. At times uncooperativeness toward the authoritative figure persists because of fear of retaliation due to unconscious guilt related to hostility.

Artificial Ultraviolet Irradiation as a Relative Protection Against Photosensitivity: Report of Four Cases

J. L. Rudd, M.D., West Roxbury, Mass. In ARCHIVES OF PHYSICAL MEDICINE, 30:1:37, January 1949.

A method was developed which offers promise in producing relative protection against hypersensitivity to solar radiation. The method consists of graduated doses of artificial irradiation from a controlled ultraviolet source (cold quartz lamp). Four illustrative cases are reported in which applications of the method appeared to produce a temporary reduction in hypersensitivity to solar radiation.

Rheumatoid Spondylitis: Its Early Diagnostic Features and Management

Richard Z. Query, Jr., Charlotte, N. C. In JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 139:11:692, March 12, 1949.

Rheumatoid arthritis of the spine is a commonly encountered cause of backache, especially that occurring among male patients of the second and third decades of life. The disease is characterized by periods of active symptoms which alternate with periods of partial or complete freedom from discomfort. After a variable number of years (average fifteen to twenty-five) the process becomes permanently inactive. The end result of the disorder is the production of the so-called "poker spine."

In the evolution of the current concept of rheumatoid arthritis of the spine many synonyms are still in use. The varied terminology serves to confuse one not thoroughly familiar with the fact that involvement of the sacroiliac joints and lumbosacral, dorsal and cervical levels of the spine represents the usual progression of one and the same disease—rheumatoid spondylitis. Synonyms frequently encountered in the literature are Marie-Strumpell's disease, spondylitis ossificans ligamentosa of Knaggs, von Bechterew's syndrome, ankylosing spondylitis, adolescent or juvenile spondylitis, spondylitis ankylopitica and spondylarthritis. The designation for this disease which is recommended by the American Rheumatism Association is "rheumatoid spondylitis."

Summary

The criteria for the diagnosis of rheumatoid spondylitis are presented. An observation relative to the difference in sex incidence among a small group of private patients with this disease is reported. This observation is at variance with that generally reported. There is no known specific cure for rheumatoid spondylitis. However, if treatment is started early in the course of the disease and continued faithfully, much can be done toward preventing and even correcting spinal deformity. The therapeutic regimen should be well rounded and should include: maintenance of a good general state of health, regulation of rest, diligent execution of deep breathing and postural exercises, appropriate physical therapy procedures and roentgen therapy to the segments of the spine that are actively involved clinically.

A Physical Medicine Rehabilitation Hospital

Robert W. Boyle, M.D., Ph.D., Fort Thomas, Ky. In ARCHIVES OF PHYSICAL MEDICINE, 30:2:82, February 1949.

Rehabilitation is a constructive program set in motion after the completion of definitive medical treatment. On this point most authorities are agreed. The balance of the concept then depends upon the type of thinking to which one dedicates himself. There are on the one hand, "part" thinkers and, on the other, "whole" thinkers. The "part" thinkers direct their attention toward the treatment of only the affected area. On the other hand, the "whole" thinkers not only consider the affected area but also extend their attention to those areas which may be indirectly or concomitantly involved. Even within the medical profession are found both types of thinkers—the "whole" and the "part." The "part" thinker teaches an amputee to use an artificial limb and then closes the case as recovered. The "whole" thinker regards the amputee as one who has lost his physical freedom. The "whole" thinker also is alert to the possible loss of his economic status, his social status, his physical attraction to his wife or family, his competitive spirit, his self-confidence and his motivation to return to normal community living. With these things in mind, a program has been developed for the patient which is dedicated to the "whole" thinking concept about rehabilitation. It encompasses physical reconstruction and psychologic, social and vocational adaptations with a view toward returning the veteran to his own community as a useful, responsible and emotionally adjusted citizen.

Domiciliary Physiotherapy

Francis Bach, D.M., D. Phys. Med., Consultant in Rheumatic Diseases, London County Council; Consulting Physician, Rheumatic Unit, St Stephen's Hospital, Fulham, London; Consulting Physician, Rheumatic Unit, St. Stephen's Hospital, Chelsea; Physician-in-Charge, Physical Medicine Department, Mount Vernon Hospital, Northwood; Consultant in Physical Medicine, Stoke Mandeville Hospital (Ministry of Pensions). In THE BRITISH JOURNAL OF PHYSICAL MEDICINE, Vol. 12, No. 1, p. 6, January-February 1949.

Disadvantages:

Among the disadvantages which are usually stressed by officials and administrators when this subject is discussed are the following:

(1) *Loss to the community of skilled personnel.*—It is said that both time and money are wasted if the physical therapist is not employed in the most profitable manner.

(2) *Cost both in time and money* often is discussed, but it is invariably the time of the physician and the physical therapist to which reference is made and not that of the patient.

Advantages:

(1) The prevention of chronic sickness and the treatment of disease in its early stages.

(2) Saving of time of the patient as well as that of the physical therapist.

(3) Freeing of hospital beds and the continuation of physical treatment for those patients who have been discharged from hospital.

(4) The treatment of patients who cannot get to hospital even if facilities are available.

(1) Patients treated in their homes are treated in their own environment. The physical therapist and the occupational therapist can better picture the patient's disability in relation to his or her background. With this knowledge they often can plan in detail the best way of correcting his disability.

(2) The patient often can be saved time. This is important whether he works at home or in an office or factory.

Type of patient for whom domiciliary treatment is indicated:

(1) *Those who cannot get to hospital.*

(2) *Chronic circulatory conditions,* such as structural heart disease or peripheral vascular disease, and *diseases of the nervous system,* such as disseminated sclerosis. Patients with spinal cord lesions can be treated at home if they have been properly trained at a special center, and if they are carefully followed up by the center and are always in close touch with the unit staff.

(3 Patients suffering from *disorders of the locomotor system,* such as rheumatoid arthritis and osteoarthritis. These can be treated at home often with advantage.

Interpretation of the Electromyogram

D. Denny-Brown, M.D., Boston. In ARCHIVES OF NEUROLOGY AND PSYCHIATRY, 61:2:99, February 1949.

In renewing electromyographic investigations of human muscles after an interval, it seems that considerable differences of opinion have accumulated in regard to the interpretation of several electromyographic changes encountered in neurologic disorders. Since electromyography is in common use in some clinics and can provide useful diagnostic information, it may be of general interest to discuss critically some of the fundamental principles involved in the method.

Conclusions

Electromyography has valuable clinical uses and is a profitable field for further study. When used as an indicator of the neuronal activity in disease processes, it should be controlled by critical appraisal of the mechanical contractile activity in the muscle concerned, for the electrical field of motor units is large and grows more extensive in proportion to the intensity of discharge. Spread of rhythms to two or more sets of leads is particularly liable to occur from large units, particularly in atrophic muscle. Few types of change are specific for types of nervous disorder, and the physiological reasons for this are discussed.

Fibrositis

James Cyriax, M.D., Physician to the Department of Physical Medicine, St. Thomas' Hospital, London. In BRITISH MEDICAL JOURNAL, 4569:251, July 31, 1948.

Fibrositis has been divided into primary and secondary. This is a separation with which I am in the fullest agreement; for in my opinion primary fibrositis is an imaginary disease and secondary fibrositis is a real entity.

Primary Fibrositis

Controversy has gone on for many years about the nature and identity of the different disorders included by common consent under this heading. The existence of fibrositis is affirmed by most clinicians, denied by most pathologists, but in the absence of an alternative explanation for the symptoms and signs purely negative views have carried little weight.

It is my purpose to draw attention to the ready solution to the problem of the existence or not of fibrositis that can be obtained by going back to first principles. This involves taking a detailed history, making a clinical examination of the patient, and drawing deductions on accepted lines from the physical signs discovered in each case. If this is done the conclusion is forced upon the unprejudiced observer that the symptoms so readily ascribed in the past to "rheumatic fibrositis" (i.e., fibrositis coming on for no apparent reason) are all in fact the result of articular lesions. I say "unprejudiced observer" advisedly; for I started my professional life as the very reverse, and it is only recently that I have been able to convince myself that the condition has no real existence.

Preconceptions to be Discarded

(1) *That muscle spasm denotes a disorder of muscle.*—Spasm of muscles about some point is a secondary phenomenon designed to protect a painful structure. Common events are prevention of a joint from being moved beyond a certain range (e.g., in arthritis) or about an inflamed viscus (e.g., in appendicitis). Generalized muscle spasm, apart from congenital myotonia, also is a secondary disorder caused by fear, cold, upper motor neurone lesions, tetany, toxins, etc.

(2) *That muscles in spasm are tender.*—At the knee or ankle, for example, where muscles and joints do not overlap, it is obvious that the pain and tenderness lie at the joint, not in the muscles, however wasted they may be and however ready to spring into spasm to protect the joint.

(3) *That tenderness of muscle indicates a muscle lesion.*—Many muscles are normally tender at only one point in their extent—e.g., the deltoid insertion at the humerus, the extensor bellies overlying the head of the radius. Moreover, in cases of root pressure in lumbar and cervical disk lesions genuine unilateral deep tenderness of muscle often is found. It was tempting to ascribe this phenomenon to small areas of fasciculation secondary to the lower motor neurone lesion, but it occurs in muscles situated where the pain is felt but not supplied by the damaged root—e.g., the trapezius and levator scapulae muscles in seventh cervical root pressure. It is never tenderness of a muscle, but pain elicited by the appropriate resisted movement that identifies a muscle lesion.

(4) *That nodules or crepitus at a muscle are significant.*—The answer is obvious now; muscular crepitus is a perfectly normal phenomenon, felt most easily at the cervicothoracic extent of the erector spinae muscle.

(5) *That limitation of movement in more than one direction can result from a muscle lesion alone.*—Though the movement that stretches the damaged muscle may be limited, all the other movements of which the joint is capable remain of full range.

(6) *That examination of conduction along a nerve suffices.*

Treatment of Primary Fibrositis

The underlying principle is simple: to secure reduction of the intra-articular displacement causing the symptoms. The actual technics of reduction have already been described and illustrated (Cyriax, 1947).

Neck.—This usually is easy, whether the patient has pain in the neck, the scapular area or the upper limb: a few sessions of manipulation seldom fail to secure reduction. Occasionally continuous traction is indicated. Operation is required in 1 per cent of all cases. Evidence of pressure on the spinal cord contraindicates manipulation.

Thorax—In simple cases one manipulation may result in full reduction; but eventual relapse is common. The difficult cases are very difficult, and it is easy to make the patient worse. If attempted manipulative reduction—even during traction—fails, rest in bed is indicated.

Backache.—Recovery follows a few sessions of attempted manipulative reduction in about half of all cases. Rest in bed relieves some others but may lead to aggravation. Epidural local analgesia has a lasting effect on some of the remainder. Once well, the patient must be shown how to avoid further attacks of internal derangement (Cyriax, 1945). The passage of time, particularly in young patients, may bring relief if the protrusion erodes the body of the vertebra.

Lumbago.—Two-thirds of all cases are considerably, one-third fully, relieved by one manipulation. Those whom manipulation does not affect should receive an epidural injection at once. Rest in bed ensures recovery in the end: but this consumes much more time and often can be avoided if these measures are tried first.

Sciatica.—Manipulation is particularly apt to be effective in the elderly; in patients under the age of 50 it is likely to succeed in only one case in four. It is always worth trying, however, if the neurological signs are inconspicuous. Epidural local analgesia effects lasting improvement in others. Rest in bed eventually brings about spontaneous reduction in most cases. If sustained pressure results in atrophy of the affected nerve root the symptoms slowly disappear, though the signs of parenchymatous involvement increase. Operation is required in about one case in eight.

Medical Aspects of Chronic Joint Disease

Elbert L. Persons, M.D. From the Department of Medicine, Duke University School of Medicine, Durham, North Carolina. In THE NEBRASKA STATE MEDICAL JOURNAL, 34:3:90, March 1949.

The Basis of Treatment. In rheumatoid arthritis and fibrositis we are dealing with inflammatory conditions of unknown cause for which no specific treatment is available. Remissions and even apparent cures are frequent, occurring for reasons which we do not know. There must be, somewhere in the human body, a strong factor of resistance to this type of inflammation, present to marked degree in many individuals, since the majority of cases run a prolonged course and fulminating cases of true rheumatoid disease are uncommon. The only rational approach is a positive one of attempting to remove all burdens which can be found. Pain is the foremost of these and orthopedic and physical therapy measures and drugs are of great importance. Foci of infection should be removed if they seem to be definite and significant, but occupational, environmental and psychologic burdens, including fear of incapacity and dependency never should be overlooked.

The use of gold is still controversial. There is no evidence that it can be used as a substitute for the more thorough approach which is suggested here .

Summary. Our present knowledge of chronic joint disease is such that we must be familiar with the descriptive aspects and study each patient individually. Routines of treatment based on unproven hypotheses should be avoided. The separation of other clinical entities from the group of arthritic diseases is a valuable forward step, and a simple standard classification is helpful in planning treatment for the individual case. The greatest simple problem confronting us is the nature of the inflammatory process involved in rheumatoid disease and the factor of resistance in the human organism which is responsible for remissions and chronicity.

Diagnosis and Pitfalls in Diagnosis of Poliomyelitis

A. F. Abt. In JOURNAL-LANCET, 68:383, October 1948. Abstracted in JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 139:10:672, March 5, 1949.

Abt distinguishes three broad clinical types of acute anterior poliomyelitis; namely, abortive, nonparalytic and paralytic poliomyelitis. Neither a clinical nor a laboratory diagnosis can be made for the abortive type of poliomyelitis, because in this systemic phase of the disease a single symptom or combination of any symptoms may be the forerunner of any acute infection. There is no involvement of the central nervous system at this stage of the disease, and therefore lumbar puncture will reveal a normal spinal fluid. Nonparalytic poliomyelitis may be diagnosed from history, symptoms and clinical signs and spinal fluid changes even though no paresis or paralysis develops, particularly in those cases which occur during a season of the year in which poliomyelitis is known to be prevalent and during epidemic periods. Such cases were common in Illinois during the summer and fall of the 1947 season. This second stage of the disease involves the central nervous system, and in addition to the general symptoms of fever, headache, anorexia, nausea and vomiting there may be stiffness of the neck and of the back. The most indicative signs for diagnosis are the spine sign (ventral flexion) and the head drop. If both these signs are absent, a positive diagnosis probably will not be made. If one or both are present with characteristic spinal fluid changes, a positive diagnosis should be relatively easy. If paralysis occurs, it usually develops on the second or third day of this phase of the disease. Pain, diminution or loss of the deep reflexes and weakness or twitching of muscle groups may be premonitory signs of approaching paralysis. Only a rapid method for virus identification could positively indicate whether many of the cases seen in Illinois this fall were actually due to the poliomyelitis virus or to such other known viruses such as the St. Louis encephalitis, equine encephalomyelitis, a different strain of poliomyelitis, or a new and unknown virus. Until a rapid method for virus culture is obtained, only a presumptive and not a positive diagnosis of such cases may be made.

Setting Up the Disabled

C. B. Heald, C.B.E., M.D., Camb., F.R.C.P., D.P.H., Consulting Physician to Royal Free Hospital. In THE LANCET, 6545:256:234, February 5, 1949.

More and more attention is now being paid to the fate of the patient after he leaves hospital.

Every investigation brings a similar group of facts to light. First, a high relapse-rate entails waste of beds, effort, and money, and the causes of relapse therefore deserve more thought. Secondly, the task of setting up the disabled, like the approach to positive health, is a study in itself. Thirdly, of the various groups into which the disabled fall, the homebound are the least provided for and the most difficult to reestablish.

The term "setting up" has been chosen deliberately. The dictionary defines the setter-up as "one who establishes"—implying a positive act, by a new or definite process. This is an improvement on words beginning with "re"—rehabilitation, reemployment, reinstatement—since these all signify a return to some former state. We should get away from the idea that the disabled should always, or whenever possible, be pushed back to their former employment. Such reinstatement suits some, but only some.

Setting up calls for a skilled study of the individual—his history, neighborhood, aptitudes, and character, but above all his home. He must be freed from the notion that he must work back painfully and inefficiently to a former state; instead he must be established, enlivened, and given security. Setting up is a special phase in his life, distinct from wellness or active illness. Properly used it should reduce the relapse-rate, ensure better coordination between responsible bodies, provide continuous care for the patient, speed the turnover in general hospitals, and encourage the pooling of special knowledge. If we pay more attention to the home we shall go far towards solving the problem of the home-bound.

Surgical Relief of Pain in Shoulder and Upper Extremity

A. F. Jonas. In PENNSYLVANIA MEDICAL JOURNAL, 51:1377, September 1948. Abstracted in JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 139:8:547, February 19, 1949.

The author points out that pain in the shoulder and upper extremity frequently is dismissed as "neuritis" or treated with heat and salicylates with indifferent or poor results. In a large proportion of cases the pain is caused by a lesion amenable to surgical or orthopedic correction. Understanding of the neurologic pathways mediating such pain is essential. Two of the author's patients with cervical ribs had undergone previous cholecystectomy without relief; another with cervical intervertebral disk had led the restricted life of an anginal cripple. The author discusses pains caused by lesions of the cervical intervertebral disks and by cervical ribs; also the scalenus anticus syndrome, lesions involving the peripheral nerves and those involving the autonomic nervous system, such as Raynaud's disease and Weir Mitchell's causalgia. Surgical procedures are available for relief of these conditions and deserve a wider appreciation.

Rehabilitation: Its Application to Compensation Medicine

Howard A. Rusk, M.D., Professor and Chairman of the Department of Rehabilitation and Physical Medicine, New York University College of Medicine and Director, Institute of Rehabilitation and Physical Medicine, New York University-Bellevue Medical Center. In COMPENSATION MEDICINE, 1:8:29, December 1948.

Until the advent of World War II, medical care, psychologic problems and vocational retaining of the disabled worker to the point where he could resume productive work were too frequently considered as separate and distinct processes having little relationship to each other. That they are interdependent and inseparable has been demonstrated by the successful programs in military and veterans' hospitals and has been recognized in civilian rehabilitation by the Barden-LaFollette Amendment, which expanded the federal-state vocational rehabilitation program to include physical restoration, psychiatric services and medical care, as well as vocational guidance and training.

Immediately following World War I as today, there was a developing interest in increasing rehabilitation opportunities for the disabled. Unfortunately, this interest died in most quarters in the years between the wars. From it, however, did come some pioneer institutions, such as the Institute for the Crippled and Disabled in New York and the Curative Workshop of Milwaukee and Cleveland Rehabilitation Clinic, and some basic legislation, such as the Federal Vocational Rehabilitation Act of 1920. The failure of the movement to gain sufficient stature to become an accepted part of medicine can be attributed to the fact that it was restricted largely to guidance, trade training, and the purely vocational aspects of rehabilitation. Few provisions were made for physical restoration or reducing the physical disabilities of the trainees.

There are some 23,000,000 persons in the United States handicapped to some extent by disease, accidents, maladjustment or war. One-third of all draftees were rejected as unfit, and more than 1,000,000 had to be discharged shortly after induction. It is estimated that there are over 7,000,000 persons in the United States disabled by diseases of the heart and arteries, 6,850,000 from rheumatism and arthritis, and 2,600,000 from orthopedic conditions. A statistical review of the casualties in industry for 1947 shows that there were 2,050,000 persons temporarily disabled and 91,000 persons permanently disabled from accidents or occupational disease. One in every 30 workers suffered a disabling injury.

The present programs of the military services and the Veterans Administration have dramatically demonstrated that rehabilitation pays economic as well as social and personal dividends, even for those who suffer from long-standing chronic illness. Typical of the results obtained in the Veterans Administration Medical Rehabilitation Service is a study of 130 chronic neurologic patients in one hospital, all but two of whom were World War I veterans, and many of whom had not been out of bed in ten years. After nine months of medical rehabilitation, 25 had left the hospital and were employed; 40 others had been discharged to their homes capable of light work, and, of those remaining, 30 were ambulatory and undergoing advanced rehabilitation and 25 were capable of some self-care. All but ten of the group had shown worthwhile, permanent improvement. With a five-year life expectancy of these patients, and a per patient day hospitalization cost of over $12, rehabilitation of this one group has saved the government, and eventually the taxpayer, over $1,250,000. It would seem logical that a similar program for the civilian disabled would result in comparative savings.

Physical Medicine in Disabilities of the Aged

Harold Dinken, M.D., Associate Professor and Director, Department of Physical Medicine and Rehabilitation, University of Colorado Medical Center, Denver. In ARCHIVES OF PHYSICAL MEDICINE, 30:2:78, February 1949.

Our aging population presents an important problem to practitioners in general and to the physiatrist in particular.

The physiologic aspects of aging have been presented and briefly discussed.

The physiologic changes associated with aging must be evaluated carefully by the physiatrist in prescribing physical treatment.

Book Reviews

Case Histories in Clinical and Abnormal Psychology. *Edited by Arthur Burton and Robert E. Harris. Cloth. Price, $6. Pp. 680. Harper and Brothers, 49 East 33rd St., New York 16, 1947.*

The editors have compiled this book with the expressed two-fold purpose of presenting examples of most of the personality and behavior disorders and exhibiting the work of competent clinicians. "This book was written by clinicians" according to the editors but they should specify that they refer perhaps to clinical psychologists rather than psychiatrists because of some forty-five contributors only five are physicians.

The collected articles are little more than detailed case reports of the whole gamut of psychiatric disorders. There is no attempt to weave cases together to give meaning to any concept but rather one is presented with a mass of raw material. As one would expect, case reports by clinical psychologists are replete with pages and pages of psychological tests almost in an unconscious effort to usurp the function of the psychiatric interview. The pinnacle of this type of schism is perhaps evident in the case report of a patient with migraine. After five pages of "psychological findings" there is a statement "psychiatric examination of the patient revealed findings which were in essential agreement with those disclosed in the psychological studies." The whole book smacks of an attempt to legitimize clinical psychologists as psychiatric diagnosticians and therapists.

Many of the case reports are written as dramas. Here and there are well done articles which present the material concisely and give some logical presentation of the dynamics involved. Several of the cases contain abstracts of therapeutic interviews in an effort to demonstrate the manner of conducting therapy.

This book may find some use among psychology students. It does show the application of psychological tests in the various psychiatric disorders. However, it can serve little purpose as a book on psychiatric case histories. There are many standard texts with such cases abstracted more concisely and purposefully. This reviewer finds it difficult to understand why the editors selected their title rather than to state it properly as a collection of psychiatric case histories.

Introduction to Physiology. *By W. H. Newton, D. Sc., M.D., Holt Professor of Physiology, The University, Liverpool, England. Cloth. Price, $2.50. Pp. 284, with 112 illustrations. The Williams and Wilkins Company, Mt. Royal and Guilford Avennes, Baltimore 2, Md., 1948.*

As the author indicates in his preface, the object of this small book is to present an introductory course in physiology,

suitable for both laymen and professional students. His approach is that of considering the body working as a whole, developing basic physiological concepts, and working in anatomical and physiological details against this background.

Heat production and regulation within the body; the functions of the central nervous system; movement; the general and special structural and functional organization of the body, including respiration and its relation to circulation and exercise, the utilization of food, the endocrine system, reproduction and the special senses, are the large topics considered. The rather simple line drawing illustrations with accompanying explanations are effective, and the text material lends itself to augmentation by laboratory experiments.

This book does not pretend to cover the whole of physiology at an elementary level, but is intended to inculcate a physiological outlook. It is a sound approach to the subject which should be useful to teachers and students of physical therapy.

Fundamentals of Psychiatry. *By Edward A. Strecker, M.D., Sc.D., LL.D., Litt. D., F.A.C.P., Professor of Psychiatry and Chairman of the Department, Undergraduate and Graduate Schools of Medicine, University of Pennsylvania; Psychiatrist to the Pennsylvania, Philadelphia and Germantown Hospitals; Consultant and Chief-of-Service, Institute of the Pennsylvania Hospital; Consultant to the Surgeon General, U. S. Navy. Fourth edition. Cloth. Price, $4. Pp. 325. J. B. Lippincott Company, East Washington Square, Philadelphia 5, 1947.*

This is the fourth edition of Strecker's "Fundamentals of Psychiatry" in a period of six years. This in itself speaks for the excellent reception accorded the book and undoubtedly is based upon its high merit.

In this brief review of present-day psychiatric principles the book supplies a useful fund of information for students and general practitioners who wish to revise their orientation. It is simply written on formal lines so that the various aspects of etiology, symptomatology and formulation are discussed. There is no reference to complex psychoanalytical terminology and the author cleverly avoids the confusion of the unconscious by calling it "not-conscious." The chapters on classification have been revised so that the Army classification is described as well as the author's own classification based on reactive tension states. The chapters dealing with experience gained from the recent war are highly informative.

This book is highly recommended for the exposition of the fundamentals of psychiatry for those who are in the formative stages of their understanding of the subject.

Techniques in Physiotherapy. *Edited by T. L. Greenhill, S.R.N., M.C.S.P., T.H.T., Sister-in-charge, Medical Rehabilitation Unit, Royal Free Hospital, late Sister-in-charge, Rehabilitation Unit, Hill End E.M.S. Hospital (St. Bartholomew's), Former Member Council of Chartered Society of Physiotherapy, assisted by C. B. Heald, C.B.E., M.D., F.R.C.P. in Rheumatism and Arthritis, J. N. Barron, F.R.C.S. in Burns and Injuries of the Hand, Mr. J. Colson, M.C.S.P., M.A.O.T., Occupational Therapy in Medicine and Surgery. Cloth. Price, 12/6. Pp. 222, with 37 figures and 8 plates. Hodder and Stoughton, Ltd., Warwick Square, London, E. C. 4, England, 1948.*

This volume presents some of the newer concepts of physical methods and their application to the problems of rheumatism and other medical and surgical ailments. The book is designed to provide the practicing physical therapist with a selected number of technics that have successfully passed the hard school of actual practice. Those employed by the orthopedic surgeon have been so fully described in books and papers during recent years that the editor has not included a separate chapter on the physical methods employed in orthopedic surgery. However, some technics and methods which have been found of genuine value in certain aspects of orthopedics have been included in the text.

The author states that much of the material used in the chapter on "Occupational Therapy" has been taken from Mr. Colson's textbook on "Rehabilitation of the Injured," and the same applies to the chapter on "Suspension Therapy" which has been taken from Mrs. Guthrie-Smith's textbook "Rehabilitation, Reeducation and Remedial Exercises."

This is a concise description of physical therapy technics.

Collateral Circulation (Anatomical Aspects). *By Daniel P. Quiring, Ph.D., Head of the Anatomy Division, Cleveland Clinic Foundation; Associate Professor of Biology, Western Reserve University. Cloth. Price, $5. Pp. 142, with 61 illustrations, 46 in color. Lea & Febiger, Washington Square, Philadelphia 6, 1949.*

This book presents the anatomical aspects of collateral circulation. At the same time, there is included a discussion of the many factors which must be considered in determining the success or failure of a collateral network.

This convenient compilation of material on collateral and anastomosing arterial and venous channels will prove especially useful to surgeons as an aid in determining surgical approaches. Anatomists and medical students will find it valuable as a guide to these chief anastomosing channels. Cardiologists will be interested in the presentation as a review of recent findings in connection with the revascularization of the heart.

The chapters on "Formation of Capillary, Arterial and Venous Channels" and "General Considerations of Collateral Circulation" will be of interest to physical therapists.

Headache and Other Head Pain. *By Harold G. Wolff, M.D., Professor of Medicine (Neurology) and Associate Professor of Psychiatry, Cornell University Medical College; Attending Physician, The New York Hospital, New York. Cloth. Price, $12. Pp. 664, with 154 illustrations. Oxford University Press, 114 Fifth Avenue, New York 11, 1948.*

For a long time there has been a great need for a scientific and authoritative book on headaches. The author has filled this need in admirable fashion.

The anatomy and physiology of pain sensitive structures in the head and body are first clearly outlined. Considerable original work is presented throughout and synthesized in such a fashion that definite information is available for clinical application. The remainder of the book is devoted to a discussion of the character and reasons for headaches in a wide variety of diseases, such as brain tumor, hypertension, migraine, sinusitis, neurosis. Each section is amply discussed and experimental work is presented to support the conclusions. Case histories are described in sufficient numbers to elucidate each problem. The numerous illustrations are mostly diagrammatic but are clear and precise.

The last two chapters of the book will be particularly helpful. The section on the action of analgesics is a review of the physiologic and psychologic principles involved in drug action. The summary in the last chapter will be particularly attractive to busy clinicians who wish to get a bird's-eye view of the whole field.

The book is well written and illustrated. The bibliography is excellent. The author has produced for ready availability the answers to many problems that face us every day but even more he inspires one to think in physiologic terms. He also has brought out the importance of the considerations of the personality factors in the production of head pain. It is an admirable book and deserves wide circulation.

Treatment by Manipulation in General and Consulting Practice. *By A. G. Timbrell Fisher, M.C., M.B., Ch.B., F.R.C.S. (Eng.), Commander of the Order of St. John of Jerusalem, Fellow of the International College of Surgeons; Member of the American Academy of Orthopedic Surgeons; Orthopedic Surgeon to the Rheumatic Unit, St. Stephen's Hospital; Trustee and Member of Executive and Scientific Advisory Committees of Empire Rheumatism Council; Late Hunterian Professor of the Royal College of Surgeons of England; Chairman of Nomenclature Committee, Royal College of Physicians' Committee on Rheumatism, Etc. Fifth edition of "Manipulative Surgery." Cloth. Price, $5. Pp. 275, with 126 illustrations. Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, 49 E. 33rd Street, New York 16, 1948.*

In this fifth edition Doctor Fisher has added forty-five additional illustrations. Many sections have been rewritten and expanded to incorporate recent advances in the treatment of the crippling deformities of rheumatic disease. Doctor Fisher, who is chairman of the Nomenclature Committee of the Royal College of Physicians' Committee on Rheumatism, uses the term "physical therapist" throughout the book.

Objections to manipulation often given by physicians and surgeons are the increased pain and stiffness, and the shock and acute reaction which are alleged to follow. It is certainly true that some or all of these untoward results may follow lack of technical skill and an unwise choice of cases, but disaster and disappointment may be the penalty of ignorance and lack of skill in any sphere of medicine or surgery. However, these sequels are extremely rare in the practice of those who have the necessary skill and experience and who have acquired the knowledge necessary to select those cases which are suitable for manipulation and above all the knowledge of when this measure should be avoided.

The second objection consists in the view that restoration of function and full range of joint movement can in most cases be restored by methods of physical medicine such as exercises. Such measures may be of the greatest value, but there is a tendency to forget their limitations. It frequently is found that a patient improves up to a point and then progress ceases. It is at this stage that manipulation often is of the greatest value, and can sometimes be achieved in five minutes of manipulation as compared to five months of other physical medicine.

There are many chapters of interest which should be read by physical therapists. Physical therapists should not do manipulation but should do after-treatment. There is a chapter on "Notes on After-Treatment." The author states: "Some of the principal points in after-treatment have, as far as possible, been discussed under individual headings. In this chapter an attempt will be made to summarize briefly the main principles."

Deep Massage and Manipulation Illustrated. *By James Cyriax, M.D., B.Ch. (Cantab.), Physician to the Department of Physical Medicine, St. Thomas' Hospital, London. Third Edition. Cloth. Price, $5. Pp. 278, with 104 illustrations. Paul B. Hoeber, Inc., 49 East 33rd St., New York 16, 1948.*

When massage is required for deep-seated tissues it must be given with penetrating effects. Great accuracy in technic is essential. A technic for affecting each of the structures of the body which commonly require this treatment is described and illustrated in this book. Although there often are alternative methods, the methods given and illustrated have been found best suited to the majority of physical therapists. These technics at least form a starting point from which the physical therapist can evolve the method that comes most easily to her own hands.

The illustrations and the descriptions appended to them are designed for the guidance of physical therapists called upon to treat deeply-situated lesions. The methods described ensure that treatment shall reach the actual site of the lesion. The author believes that the adoption of these methods will in due course dispel much of the present-day scepticism of the therapeutic power of manipulation and manual frictions.

Superficial treatment over the whole site at which pain is felt is still practiced. But thanks largely to our present understanding of pain and of the way in which it is referred from the actual site of the causative lesion, the author believes that there are now very few who regard such treatment as adequate. This book should be read and this method of massage studied by all physical therapists.

Meet Our New Contributors

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